INTELLIPORT II / INTELLIPORT II EXPANDABLE

UNIX SOFTWARE REFERENCE GUIDE

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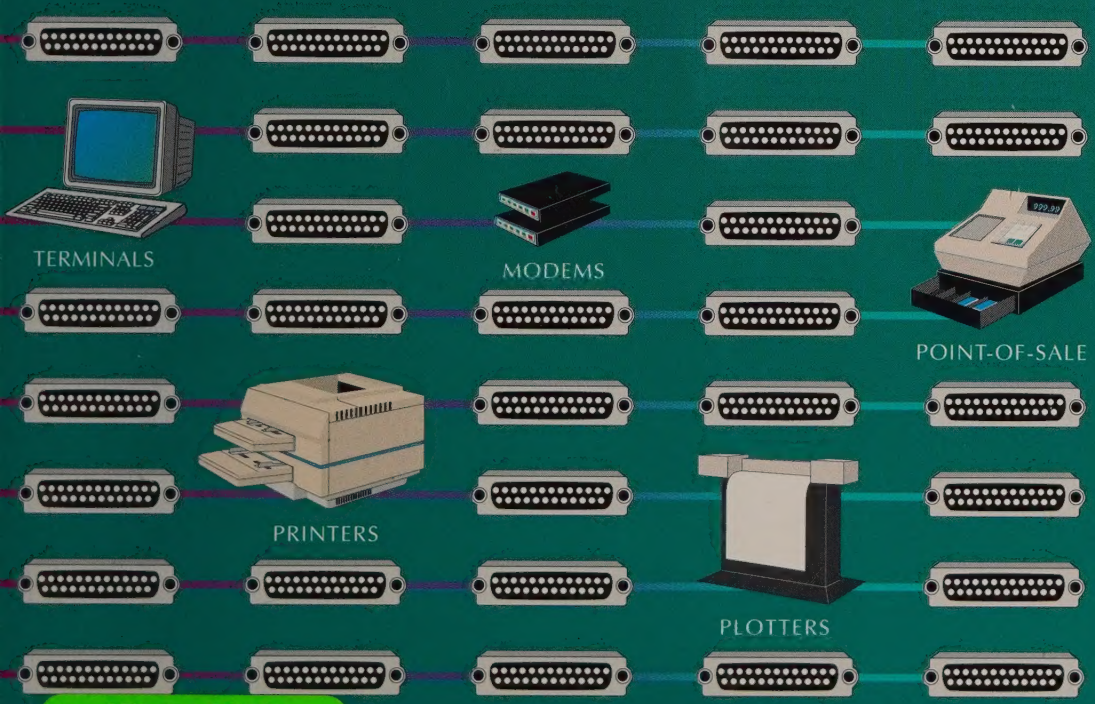

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IntelliPort II
UNIX Software Reference Guide

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The IntelliPort™ II UNIX® Software Reference Guide describes procedures for installing software drivers for the Computone™ IntelliPort II and IntelliPort II EXpandable line of multi-port serial products under the UNIX and XENIX® operating systems. This manual also describes troubleshooting procedures, files, utilities, and Computone's exclusive IntelliFeatures™.

Who Should Use It

This manual is intended for system administrators who are installing and maintaining IntelliPort II software drivers under the UNIX and XENIX operating systems. You should have some basic knowledge of what serial hardware (terminals, modems, printers, etc.) you want to attach to each port.

If you are installing IntelliPort II hardware, you should read the *IntelliPort II Hardware Reference Guide.*

Chapter Summary

The IntelliPort II UNIX Software Reference Guide consists of the following chapters:

Chapter 1 - Introduction
Briefly describes the IntelliPort II UNIX/XENIX software, including capabilities and IntelliFeatures.

Chapter 2 - Installation
Provides detailed instructions for installing the IntelliPort II software drivers in UNIX and XENIX systems.

Chapter 3 - System Administration
Provides descriptions of IntelliFeatures, device assignments, and instructions for changing terminal configuration. Some brief information on tuning the kernel is also included.

Chapter 4 - Troubleshooting
Describes software problems that you may encounter during and after installation, and provides solutions.

Appendix A - IntelliPort II System Reference
Describes in detail the files and utilities included with the IntelliPort II software drivers.

This manual also includes an index.

Conventions

This manual uses the following conventions and descriptions:

Controller	The card that you install inside your host system. Other common names include *card* and *adapter.*
EISA	Acronym for Extended Industry Standard Architecture. A 32-bit bus design that is downward-compatible with ISA (AT) bus hardware.
Expansion Module	Part of the IntelliPort II EXpandable system, the expansion module includes 8 or 16 ports, an LCD display, and a three-button control panel. You can attach up to four expansion modules together for a total of up to 64 ports.
Expansion Box	Part of the standard IntelliPort II system, the expansion box provides the interface to eight or sixteen RS-232 ports with either DB-25 or RJ-45 connectors.
Host	The ISA, EISA, or Micro Channel™ system in which you install the IntelliPort II.
IntelliPort II EXpandable	The modular, expandable line of IntelliPort II products. You can purchase configurations providing 8 to 64 ports, depending on your needs. You can add expansion modules later to increase the number of available ports.

Interface Module	A generic term that refers to both expansion modules and expansion boxes.
ISA	Acronym for Industry Standard Architecture. The 16-bit bus design found in IBM® PC-AT® and compatible computers.
PC	Acronym for Personal Computer; refers to any ISA, EISA, or Micro Channel system. In this manual, *PC* is interchangeable with the term *host.* ("PC" is somewhat of a misnomer in this manual, since most IntelliPort II products are installed in multi-user systems.)
Serial Device	Any external device that you might attach to an IntelliPort II port. The most common examples are terminals, modems, and printers, but may include plotters, sensors, data-gathering devices, and so on.
Standard IntelliPort II	The IntelliPort II products that provide a fixed number of ports (4, 8, or 16 ports, depending on the model).

Chapter 1
Introduction

This chapter provides a brief overview of the IntelliPort II UNIX software drivers and important features of the IntelliPort II.

Product Overview

The IntelliPort II is a combination of hardware and software that lets you add from 4 to 256 asynchronous serial ports to your ISA, EISA, or Micro Channel host system. There are two separate groups of IntelliPort II products: the standard IntelliPort II and the IntelliPort II EXpandable. The *IntelliPort II Hardware Reference Guide* describes each type of product.

The IntelliPort II UNIX drivers provide a tty-style interface to the IntelliPort II ports (for example, `/dev/ttys00`), and support serial communications at data rates up to 115,200 bps. IntelliPort II port devices are compatible with standard UNIX/XENIX *tty* devices.

The IntelliPort II UNIX software drivers also provide *IntelliFeatures*, a package of features that make serial communications more powerful and convenient. The sections following describe IntelliFeatures.

IntelliView

IntelliView™ lets a terminal with multi-page memory display up to eight different screens, letting users instantly toggle from one screen to another. The number of screens supported by each IntelliPort II controller is specified during software installation (Chapter 2).

IntelliView supports a Main screen and up to seven Alternate screens on each terminal or workstation that is connected to an IntelliPort II. IntelliView scans incoming characters for special sequences (the user generally presses function keys to generate these sequences) to switch from one screen to another. Alternate screens are virtual devices; each alternate screen has a unique device name, but shares the physical device (terminal) with the Main screen and other Alternate screens.

IntelliPrint

IntelliPrint™ allows use of the AUX (auxiliary) port present on many terminals. A printer connected to a serial or parallel AUX port appears to the system as a separate device.

IntelliPrint multiplexes data between the terminal's screen and the printer. Control sequences, inserted by IntelliPrint and supported by the terminal, determine whether data should be routed to the screen or to the printer.

IntelliSet

IntelliSet™ lets you select data rate, flow control, and similar hardware-related features that are not directly supported by the operating system or device drivers. The IntelliPort II downloaded firmware, or *loadware*, provides IntelliSet support. You can lock individual parameters in place, or specify them as defaults that can be subsequently changed.

IntelliSet may be used in combination with other features; all virtual devices (IntelliView Alternate screens and IntelliPrint devices) are affected. IntelliSet uses profiles in the *intellicap* and *intellitype* files to configure devices.

For more information on these files, see Appendix A.

Features Summary

- **Compatible with ISA, EISA, and Micro Channel systems.**

- **Compatible with UNIX and many derivative operating environments.** The IntelliPort II products work with the following systems:
  - AT&T®/USL UNIX SVR3.2, SVR4.0, and SVR4.2
  - ESIX™ UNIX SVR3.2
  - Intel® UNIX SVR3.2
  - Interactive™ UNIX 386/ix™, SVR3.2 or higher
  - SCO™ UNIX V/386, Release 3.2
  - SCO XENIX 386, Release 2.3
  - SCO Open Desktop™

- **RAM-resident loadware.** The IntelliPort II low-level driver software, or *loadware*, is downloaded to the IntelliPort II controller while the system is booting. This lets you upgrade your software drivers without replacing EPROMs.

- **Surge/spike suppression.** Transient suppression hardware is standard on 4-port and 8-port products and is available as an option on 16-port and EXpandable models. This protects your investment in serial equipment as well as your IntelliPort II system.

- **Flexible expansion options.** Standard IntelliPort II products support 4, 8, or 16 ports, depending on which model you choose. IntelliPort II EXpandable products support up to 64 ports per controller. You can install up to four controllers in a host system, for a total of up to 256 ports per host.

- **Low hardware resource usage.** IntelliPort II products require no RAM or DMA channels. Each controller requires only eight I/O addresses and one IRQ. If you install more than one IntelliPort II controller in your host system, they share the same IRQ, minimizing the need for host resources.

- **Flexible port configuration options.** You can select from any of 23 standard data rates, from 50 bps to 115,200 bps. Transmit and receive data rates can be set independently of each other. User-programmable data rates are also supported.

- **On-board flow control.** IntelliPort II supports both hardware (RTS/ CTS) and software (XON/XOFF) flow control within the IntelliPort II hardware. This reduces host CPU overhead, improving system response time.

- **Exclusive IntelliFeatures support.** *IntelliView* allows terminals with multi-page memory to display up to eight different screens. *IntelliPrint* allows users to access printers attached to local terminals as separate devices. *IntelliSet* lets system administrators build a set of custom port profiles, containing such information as data rate, flow control, parity, and other related parameters, and assign the profiles to individual ports.

- **Easy to upgrade.** You can upgrade or re-install the IntelliPort II drivers without removing the original drivers. Site-specific profiles and terminal assignments are left intact. This makes adding new controllers or expanding current (II EXpandable) port counts a simple task.

Chapter 2
Installation

This chapter describes how to install the IntelliPort II device drivers from the supplied product diskettes.

Installation procedures are outlined for a number of different operating environments, including:

- AT&T/USL UNIX V, Releases 3.2, 4.0, and 4.2
- Interactive UNIX 386/ix, Release 3.2 or higher
- Intel System V, Release 3.2
- ESIX UNIX V 386, Release 3.2
- SCO Open Desktop
- SCO UNIX V/386, Release 3.2
- SCO XENIX 386, Release 2.3

If your operating environment is not described in this chapter, contact Computone Technical Support.

Using EasyInstall

During IntelliPort II device driver software installation, you will encounter several EasyInstall menu screens. EasyInstall supports the following function keys:

Key	Ctrl-key	Function
F1	Ctrl-I	Help
F2	Ctrl-O	List Choices
F3	Ctrl-E	Save
F4	Ctrl-X	Exit
F5	Ctrl-C	Copy Line
F6	Ctrl-K	Clear Field
ENTER		Next Field
PgUp	Ctrl-F	Next page of form
PgDn	Ctrl-B	Previous page of form
↑	Ctrl-U	Cursor up
↓	Ctrl-D	Cursor down
←	Ctrl-L	Cursor left
→	Ctrl-R	Cursor right

These functions are context-sensitive, and may not be available at all times. When EasyInstall displays its menus, you can also use the arrow keys to move from one menu choice to another.

General Configuration Notes

When you install an IntelliPort II product in a UNIX, XENIX, or derivative system, you should first install the driver software, then install the IntelliPort II hardware.

This manual describes only the software installation procedures. For information on hardware installation, see the *IntelliPort II Hardware Reference Guide*.

If you are reinstalling or updating the driver software, your terminal and port configuration is preserved unless you explicitly change it. The update procedure also reinitializes the IntelliPort II controllers with any new changes. You do not have to remove your current IntelliPort II software or files before reinstalling or updating the driver software.

System Dependencies

The IntelliPort II UNIX drivers impose the following dependencies:

- You can install up to four controllers in one system.
- All IntelliPort II controllers must share the same IRQ.
- If you have an EISA system, you cannot install IntelliPort II ISA and IntelliPort II EISA controllers in the same system.

IRQ Selection

Your IntelliPort II controller requires a single interrupt request vector (IRQ) when communicating with the host system.

During IntelliPort II software installation, you pick an available IRQ and enter that IRQ in the Hardware Reference Log (Appendix A of the *IntelliPort II Hardware Reference Guide*).

For more information about IRQs, see the *IntelliPort II Hardware Reference Guide*.

I/O Address Selection

Each IntelliPort II ISA and Micro Channel controller requires its own block of eight consecutive I/O addresses on the host system. If you are installing multiple IntelliPort II controllers, they *cannot* share the same I/O addresses. During IntelliPort II software installation, you pick a base I/O address and enter that address in the Hardware Reference Log (Appendix A of the *IntelliPort II Hardware Reference Guide*).

IntelliPort II EISA controllers automatically determine the base I/O address by slot number. During software installation, you pick a slot number and enter that slot in the Hardware Reference Log (Appendix A of the *IntelliPort II Hardware Reference Guide*).

For more information about I/O addresses, see the *IntelliPort II Hardware Reference Guide.*

Installation Quick Reference

This section provides abbreviated procedures for installing the IntelliPort II software drivers under each operating system. If you are familar with driver installation procedures, you can most likely use the procedures in this section. If you need more detailed instructions, see the "Installation Steps" section in this chapter that refers to your host's operating system.

Quick Installation: UNIX SVR4 (Releases 4.0 and 4.2)

To install the IntelliPort II drivers on a UNIX SVR4.0 or SVR4.2 system, follow these steps:

1. If you are using *sysadm* to install the drivers, do the following:
   - Select "software" from the System Administration Menu.
   - Select "install" from the Software Installation Menu.
   - In the "Package Location" field, enter `diskette1` or `diskette2` to indicate which diskette you are using for driver installation and enter `ip2` as the package name.

   If you are using *pkgadd* to install the drivers, type the following command:

   ```
   /usr/sbin/pkgadd -d diskettex
   ```

   where *x* is the diskette drive you are using for driver installation.

2. Choose the installation type: *ttymon* (default) or *getty*.

3. Specify the IntelliPort II hardware being installed:
   - the number of controllers
   - IRQ
   - the controller type
   - I/O address range (ISA, Micro Channel) or slot number (EISA)

4. Specify the number of IntelliView screens to create for each port.

5. For IntelliPort II EXpandable controllers, specify the number of ports on each connected expansion module.

6. For IntelliPort II ISA controllers, verify that the displayed DIP switch settings match those on the controller.

7. For each port, specify the following:
   - IntelliCap profile
   - terminal type
   - login type (no screens, Main screen, all screens)
   - whether a modem is attached to this port
   - *getty* code

8. Power down the system and install the IntelliPort II controllers.

9. Boot the system. If the system boots properly, tune the kernel. Otherwise, proceed to Chapter 4, "Troubleshooting."

Quick Installation: SCO UNIX V (Release 3.2) SCO Open Desktop

To install the IntelliPort II drivers on an SCO UNIX SVR3.2 or SCO Open Desktop system, follow these steps:

1. Log in as root and start the UNIX *custom* program. Do the following:
   - Select "install" from the Main Menu.
   - Select "A New Product" from the Install Menu.
   - Select the "Entire Product" option from the "Choose an Option" prompt.

2. Specify the IntelliPort II hardware being installed:
   - the number of controllers
   - IRQ
   - the controller type
   - I/O address range (ISA, Micro Channel) or slot number (EISA)

3. Specify the number of IntelliView screens to create for each port.

4. For IntelliPort II EXpandable controllers, specify the number of ports on each connected expansion module.

5. For IntelliPort II ISA controllers, verify that the displayed DIP switch settings match those on the controller.

6. Power down the system and install the IntelliPort II controllers.

7. Boot the system. If the system boots properly, proceed to step 8. Otherwise, proceed to Chapter 4, "Troubleshooting."

8. Run */etc/mkdev fip*. For each port, specify the following:
   - IntelliCap profile
   - terminal type
   - login type (no screens, Main screen, all screens)
   - whether a modem is attached to this port
   - *getty* code

9. Tune the kernel.

Quick Installation: SCO XENIX 386 (Release 2.3)

To install the IntelliPort II drivers on an SCO XENIX 386 system, follow these steps:

1. Log in as root and start the UNIX *custom* program. Do the following:
   - Select "Add a Supported Product" from the Main Menu.
   - Select the "Install One or More Packages" option at the "Select an Option" prompt.
   - Type `ALL` at the "Enter Packages" prompt.
2. Specify the IntelliPort II hardware being installed:
   - the number of controllers
   - IRQ
   - the controller type
   - I/O address range (ISA, Micro Channel) or slot number (EISA)
3. Specify the number of IntelliView screens to create for each port.
4. For IntelliPort II EXpandable controllers, specify the number of ports on each connected expansion module.
5. For IntelliPort II ISA controllers, verify that the displayed DIP switch settings match those on the controller.
6. Power down the system and install the IntelliPort II controllers.
7. Boot the system. If the system boots properly, proceed to step 8. Otherwise, proceed to Chapter 4, "Troubleshooting."
8. Run */etc/mkdev fip*. For each port, specify the following:
   - IntelliCap profile
   - terminal type
   - login type (no screens, Main screen, all screens)
   - whether a modem is attached to this port
   - *getty* code

9. Tune the kernel.

Quick Installation:
AT&T/USL UNIX V (Release 3.2)
ESIX UNIX V (Release 3.2)
Intel UNIX V (Release 3.2)
Interactive UNIX 386/ix (Release 3.2)

To install the IntelliPort II drivers on an SCO XENIX 386 system, follow these steps:

1. Log in as root and start the UNIX *sysadm* program. Do the following:
   - Select "softwaremgmt" from the System Administration Menu.
   - Select "installpkg" from the System Management Menu.
   - Indicate the drive type and density.
2. Specify the IntelliPort II hardware being installed:
   - the number of controllers
   - IRQ
   - the controller type
   - I/O address range (ISA, Micro Channel) or slot number (EISA)
3. Specify the number of IntelliView screens to create for each port.
4. For IntelliPort II EXpandable controllers, specify the number of ports on each connected expansion module.
5. For IntelliPort II ISA controllers, verify that the displayed DIP switch settings match those on the controller.
6. Power down the system and install the IntelliPort II controllers.
7. Boot the system. If the system boots properly, proceed to step 8. Otherwise, proceed to Chapter 4, "Troubleshooting."

8. Run */etc/mkdev fip*. For each port, specify the following:
   - IntelliCap profile
   - terminal type
   - login type (no screens, Main screen, all screens)
   - whether a modem is attached to this port
   - *getty* code
9. Tune the kernel.

Installation Steps for UNIX SVR4 (Releases 4.0 and 4.2)

This section describes how to install the IntelliPort II STREAMS software device drivers for UNIX System V, releases 4.0 and 4.2. Before you begin, make sure that a UNIX SVR4-compatible operating system is installed and active on your system, and that you have the correct driver software for your operating system.

Starting Installation

The first phase of software installation is starting the IntelliPort II driver installation program. You can install the IntelliPort II drivers under either *sysadm* or *pkgadd*.

Starting Under sysadm

If you have the *sysadm* utility on your system, follow these steps. Otherwise, skip to the next section, "Starting Under *pkgadd*."

1. Log onto your system as root. Start up the system administration program by entering:

   ```
   sysadm
   ```

2. From the System Administration Menu, select "software" and press **ENTER**. From the Software Installation Menu, select "install" and press **ENTER**.

3. Enter `diskette1` or `diskette2` in the Package Location field to indicate the diskette drive you intend to use for device driver installation, then enter `ip2` as the package name. Do not change the values of any other fields. Press **F3** to put your selections into effect.

4. When prompted to do so, insert the *IntelliPort II STREAMS Driver Diskette* in the floppy drive. Follow the instructions on the screen.

Starting Under *pkgadd*

If you do not have the *sysadm* utility on your system or wish to use the *pkgadd* utility instead, follow these steps:

1. Log onto your system as root. Enter the command:

   ```
   /usr/sbin/pkgadd  -d diskettex
   ```

   where *x* is the diskette drive that you intend to use for IntelliPort II device driver installation.

2. When prompted to do so, insert the *IntelliPort II STREAMS Driver Diskette* in the floppy drive. Follow the instructions on the screen.

Setting Controller Parameters

The next phase of driver installation is to set controller parameters and parameters that affect all ports on the controller. Follow these steps:

1. Choose the installation type you want. The available options are *getty* and *ttymon*; the default is *ttymon*.

2. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

3. When the first installation program screen appears, do the following:

   - Indicate the number (1 - 4) of IntelliPort II controllers installed in the system.
   - Indicate the IRQ that the controllers are to use. Press **F2** to see a list of available IRQs. Write down the IRQ you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide*.

   Press **F3** to continue.

> **Important**: If you press **F2** and no interrupts are available, stop the installation immediately and call Computone Technical Support.

4. When the next installation program screen appears, do the following **for each controller**:

   - Specify the type of IntelliPort II controller you are installing in the "Board Type" field (press **F2** to list choices).
   - For ISA and Micro Channel controllers, specify the base I/O address that this controller is to use. Press **F2** to see a list of available I/O addresses. You must assign a unique base I/O address to each IntelliPort II controller. Write down the base I/O address you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide*.
   - For EISA controllers, specify the slot number that this controller is to use. Press **F2** to see a list of available slots. You must assign a unique slot to each IntelliPort II controller. Write down the slot number you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide*.
   - Specify the maximum number of IntelliView screens to be accessible from attached terminals in the "Max Screens/Terminal" field. The following table shows valid selections.

Number of Screens	Enables IntelliView Main Screen plus
1	Zero (0) Alternate Screens
2	One (1) Alternate Screen
3	Two (2) Alternate Screens
4	Three (3) Alternate Screens
5	Four (4) Alternate Screens
6	Five (5) Alternate Screens
7	Six (6) Alternate Screens
8	Seven (7) Alternate Screens

This selection applies to all terminals attached to an IntelliPort II. You can assign fewer screens to individual terminals by assigning different profiles to each terminal.

Press **F3** to put your selections into effect. See Chapter 3 and Appendix A for more information on the IntelliView feature.

If you specify four or more screens per terminal (one Main screen and three or more Alternate screens), the installation program prompts you to confirm the number of screens that you specified. Specifying a large number of screens can place a heavy burden on system resources; most terminals support three or fewer screens.

➡ **Note**: To change the maximum number of screens available, you must re-install the drivers.

5. If you are configuring an IntelliPort II EXpandable product, specify the number of ports (8 or 16) on each external concentrator. The "Box1" field indicates the concentrator closest to the controller, the "Box2" field indicates the next concentrator, and so on.

   Press **F3** to record your selections.

6. If you installed one or more ISA controllers, the screen displays the proper I/O address DIP switch settings.

   Note: Make sure that the DIP switch settings displayed on the screen match those on the controller(s).

   Press any key to continue. The installation program processes package and system information, then installs drivers and files.

Setting Individual Port Parameters

The last phase of driver installation is to set individual port parameters. Follow these steps:

1. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

2. Assign an IntelliCap profile to each port (press **F2** to list choices). The *dumb* setting specifies no IntelliFeatures; that is, no IntelliView Alternate screens or IntelliPrint. Press **F3** to put your selections into effect.

3. Specify the following parameters for each port (press **F2** to list choices for each parameter):

   - Choose the terminal type for each port in the "Terminal Type" field. The installation program writes terminal type selections to the file */etc/ttytype*.
   - Choose the login type for each port in the "Logins Enabled" field. Choices are None (logins are disabled for the port), Main (logins are enabled only for the Main screen), and All (logins are enabled for the Main screen and all Alternate screens).
   - Indicate whether a modem is connected to each port in the "Modem" field. Choices are Yes and No.
   - Indicate the terminal communications entry for each port in the "Getty Code" field (this field also applies to *ttymon* configurations).

     Press **F3** to save your selections and continue.

   The installation program lists the files created or changed, builds the configuration files, and relinks the kernel.

4. Press **ENTER**, then exit the *sysadm* or *pkgadd* program.

5. Remove the *IntelliPort II STREAMS Driver Diskette* and shut down the system by entering:

   ```
   shutdown -g0
   ```

6. Power down the computer and install the IntelliPort II controller and interface modules as described in the *IntelliPort II Hardware Reference Guide*.

7. Start up the system and watch the status messages on the console. In particular, watch for messages dealing with the serial devices and the message "Initializing IntelliPort II boards." If anything goes wrong with the IntelliPort II, error messages generally show up following these messages.

   If the system boots correctly, proceed to Chapter 3, "System Administration." If any errors occur, or the system does not boot, proceed to Chapter 4, "Troubleshooting."

At this point, you should tune the operating system kernel to ensure that adequate system resources are available. See "Kernel Tuning Example" at the end of Chapter 3 for more information.

How Installation Affects the System

This section describes devices and entries added to various system files.

System Initialization

The IntelliPort II installation program adds the shell script "ip2" to the directory `/etc/idrc.d`. This script runs `/etc/ip2Init` to load the *intellicap*, *icap.site*, and *intellitype* parameter definitions.

Files

Besides the additions to /etc noted above, the installation program creates a directory `/etc/default/ip2.d` that contains the default IntelliFeatures files. The following files are of interest:

IP2_NOTES, doc.intellicap	These files contain on-line information about the IntelliPort II drivers and IntelliFeatures.
intellicap	This is the default *intellicap* file. Avoid making changes to this file, since this file is replaced when you update or re-install the IntelliPort II drivers.
icap.site	Add site-specific IntelliFeatures profiles to this file. If you update or re-install the IntelliPort II drivers, the installation program leaves this file untouched.
Node.?	These are the nodefiles loaded by *ip2Init* during system initialization.

You can edit the *icap.site* file as needed to add new IntelliCap profiles to your system. Do not modify the other files unless directed to do so by Computone Technical Support.

Device Nodes (*ttymon* and *getty*)

The installation program creates a device node named `/dev/ttys??` and a *ttymon* device named `/dev/term/s??` for each port. IntelliPrint's transparent printer devices are named `/dev/xlps??`. (In each case, the `??` refers to the device number, which is a hexadecimal number from 00 to ff.)

/etc/ttytype Entries (*ttymon* and *getty*)

The installation utility adds an entry to the `/etc/ttytype` file for each port, based on the terminal type specified in EasyInstall. The device names match the choices for the "Modem" and "Terminal Type" fields; for example, `/dev/ttyS00` if this port is intended for a modem.

For SVR4.2, these entries have no effect due to the added security features.

If you want to change the `/etc/ttytype` entries for one or more IntelliPort II ports, use the *ip2_sysadm* utility. See Appendix A for more information.

/etc/inittab Entries (*ttymon* and *getty*)

The installation utility adds one entry to the `/etc/inittab` file and its base, `/etc/conf/init.d/ip2`. The line is:

```
ip2::sysinit:/sbin/autopush -f /etc/default/ip2.d/chan.conf
```

This entry causes LDTERM and TTCOMPAT to be pushed onto the device stream whenever any IntelliPort II port is opened. No changes to the `chan.conf` file itself are necessary.

ttymon Entries

For installations using *ttymon*, the installation program creates a *ttymon* port monitor for each IntelliPort II controller. The monitor for the first controller is named `cton0`, the monitor for the second controller is named `cton1`, and so on.

The installation program also creates *ttymon* entries for each screen. Modem ports use the modem device names and use Connect-on-carrier. Non-modem devices turn off Connect-on-carrier. See Appendix A for more information.

getty Entries

For installations using *getty*, the installation utility adds one *getty* entry to `/etc/inittab` for each screen (as is done in SVR3).

If you want to change the `/etc/inittab` entries for one or more IntelliPort II ports, use the *ip2_sysadm* utility. See Appendix A for more information.

Additions and Changes under the /etc/conf Directory

For each IntelliPort II controller installed in the host, the installation program adds a file to the directory `/etc/conf/sdevice.d`. These files are typically named `fi10`, `fi11`, and so on.

For each IntelliPort II controller installed in the host, the installation program appends an entry to the `/etc/conf/cf.d/sdevice` file. These entries reference the files added to the `sdevice.d` directory.

Combined Installation Steps for:
SCO UNIX V (Release 3.2)
SCO Open Desktop

This section describes how to install the IntelliPort II software device drivers for SCO UNIX System V, Release 3.2. Before you begin, make sure that the operating system is installed and active on your system, and that you have the correct driver software for your operating system.

Starting Installation

1. Log in as root and start the UNIX *custom* program. The *custom* Main Menu appears.

2. Select the "Install" option from the *custom* Main Menu. The *custom* Install Menu appears.

3. Select the "A New Product" option from the *custom* Install Menu. At the "Choose an Option" prompt, select the "Entire Product" option.

Setting Controller Parameters

1. When prompted for Distribution Volume 1, insert the *IntelliPort II Driver* diskette into the floppy drive, highlight "Continue" and press **ENTER**.

   The installation program makes a backup kernel called *unix.old*. In case of a power failure or system crash, you can reboot from this kernel.

2. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Remove the *IntelliPort II Driver* diskette and press any key to continue.

3. When the first Form Screen appears, do the following:

   - Indicate the number (1 - 4) of IntelliPort II controllers installed in the system.
   - Indicate the IRQ that the controllers are to use. Press **F2** to see a list of available IRQs. Write down the IRQ you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide.*

   Press **F3** to continue.

> **Important**: If you press **F2** and no interrupts are available, stop the installation immediately and call Computone Technical Support.

4. When the second Form Screen appears, do the following **for each controller**:

   - Specify the type of IntelliPort II controller that you are installing.
   - For ISA and Micro Channel controllers, specify the base I/O address that this controller is to use. Press **F2** to see a list of available I/O addresses. You must assign a unique base I/O address to each IntelliPort II controller. Write down the base I/O address you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide.*
   - For EISA controllers, specify the slot number that this controller is to use. Press **F2** to see a list of available slots. You must assign a unique slot to each IntelliPort II controller. Write down the slot number you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide.*

- Specify the maximum number of IntelliView screens to be accessible from attached terminals in the "Max Screens/Terminal" field. The following table shows valid selections.

Number of Screens	Enables IntelliView Main Screen plus
1	Zero (0) Alternate Screens
2	One (1) Alternate Screen
3	Two (2) Alternate Screens
4	Three (3) Alternate Screens
5	Four (4) Alternate Screens
6	Five (5) Alternate Screens
7	Six (6) Alternate Screens
8	Seven (7) Alternate Screens

This selection applies to all terminals attached to an IntelliPort II. You can assign fewer screens to individual terminals by assigning different profiles to each terminal.

Press **F3** to put your selections into effect.

If you specify four or more screens per terminal (one Main screen and three or more Alternate screens), the installation program prompts you to confirm the number of screens that you specified. Specifying a large number of screens can place a heavy burden on system resources; most terminals support three or fewer screens.

See Chapter 3 and Appendix A for more information on the IntelliView feature.

➡ **Note**: To change the maximum number of screens available, you must re-install the drivers.

5. If you are installing an IntelliPort II EXpandable, the installation program displays a screen that lets you enter the number of ports on each expansion module (up to four modules per controller). If you have less than four expansion modules, set the number of ports on the last modules to zero. Otherwise, enter 8 or 16 ports for each module as appropriate. Press **F3** to save your changes and continue.

6. If you are installing an IntelliPort II ISA controller, the installation program displays a window that describes how to set the I/O Address DIP Switch on the controller. As described in the *IntelliPort II Hardware Reference Guide*, you must set the DIP switches to match the I/O address selection that you made in step 4.

   The operating system kernel is then rebuilt.

7. Press **y** and then **ENTER** in response to each of the following three prompts:

```
Do you wish to relink the kernel now?
UNIX kernel has been rebuilt. Do you want this kernel to boot by default?
Do you want the kernel environment rebuilt?
```

   The installation program creates a new kernel, saving the old kernel as *unix.old*, and displays a list of IntelliPort files and IntelliFeature device assignments as they are written to your hard disk. A summary of these files and device assignments can be found in the following:

/etc/default/fip.d/	(IntelliFeatures support files)
/etc/inittab	(system initialization table)
/etc/ttytype	(terminal types)
/etc/conf/	(link kit files)

➡ **Note**: IntelliFeature device assignments are described in detail in Chapter 3.

8. Press **ENTER** to continue. The following messages then appear:

```
Steps to complete installation:

Shut down your system and reboot to activate the new system.

Set up your terminals to match the baud rate, parity, data
bits, and stop bits defined in the /etc/gettydefs entry.

After rebooting, you need to type "/etc/mkdev fip" in order
to set up baud rates, terminal types, and IntelliView Screens.

Installation complete.  Press Enter to continue...
```

   See Appendix A for details about the `mkdev fip` command.

9. Press **ENTER**. When the *custom* Main Menu reappears, select the "Quit" option to exit.

Setting Individual Port Parameters

The last phase of driver installation is to set individual port parameters. Follow these steps:

1. Remove the Computone diskette from the floppy disk drive (if you have not already removed it) and shut down the system using the command:

   ```
   shutdown -g0
   ```

2. Power down the computer and install the IntelliPort II controller and interface modules as described in the *IntelliPort II Hardware Reference Guide*.

3. Start up the system and watch the status messages on the console. In particular, watch for messages dealing with the serial devices and the message "Initializing IntelliPort II boards." If anything goes wrong with the IntelliPort II, error messages generally show up following these messages.

   If the system boots correctly, proceed to step 4. If any errors occur, or the system does not boot, proceed to Chapter 4, "Troubleshooting."

4. Type `/etc/mkdev fip` at the UNIX shell prompt and press **ENTER**.

5. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

6. When the first Form Screen appears, assign an IntelliCap profile entry to each port. The *dumb* setting specifies no IntelliFeatures; that is, no IntelliView Alternate screens or IntelliPrint. Press **F2** to see a list of available profiles.

   Press **F3** to continue to the next Form screen.

7. Specify the following parameters for each port (press **F2** to list choices for each parameter):

   - Choose the terminal type for each port in the "Terminal Type" field. The installation program writes terminal type selections to the file */etc/ttytype*.
   - Choose the login type for each port in the "Logins Enabled" field. Choices are None (logins are disabled for the port), Main (logins are enabled only for the Main screen), and All (logins are enabled for the Main screen and all Alternate screens).
   - Indicate whether a modem is connected to each port in the "Modem" field. Choices are Yes and No.
   - Indicate the terminal communications entry for each port in the "Getty Code" field. The file */etc/gettydefs* contains the definitions of valid getty codes.

     Press **F3** to save your selections and continue.

   The installation program lists the files created or changed and builds the configuration files.

At this point, you should tune the operating system kernel to ensure that adequate system resources are available. See "Kernel Tuning Example" at the end of Chapter 3 for more information.

How Installation Affects the System

This section describes devices and entries added to various system files.

System Initialization

The IntelliPort II installation program adds a shell script named "S35fip_init" to the directory `/etc/rc2.d`. This script runs `/etc/fipInit` to load the *intellicap*, *icap.site*, and *intellitype* parameter definitions.

Files

Besides the additions to `/etc` noted above, the installation program creates a directory `/etc/default/fip.d` that contains the default IntelliFeatures files. The following files are of interest:

FIP_NOTES, doc.intellicap	These files contain on-line information about the IntelliPort II drivers and IntelliFeatures.
intellicap	This is the default *intellicap* file. Avoid making changes to this file, since this file is replaced when you update or re-install the IntelliPort II drivers.
icap.site	Add site-specific IntelliFeatures profiles to this file. If you update or re-install the IntelliPort II drivers, the installation program leaves this file untouched.
fipNode.fi??	These are the nodefiles loaded by *fipInit* during system initialization.

You can edit the *icap.site* file as needed to add new IntelliCap profiles to your system. Do not modify the other files unless directed to do so by Computone Technical Support.

tty Devices

For each IntelliPort II port, the installation program creates the following tty devices:

- One non-modem device, `/dev/ttys??`.
- One modem device, `/dev/ttyS??`.
- Zero or more virtual devices, `/dev/tty`**N**`??`, depending on the value of "Max Screens/Terminal" you entered during installation. **N** is in the range [T-Z], depending on how many Alternate screens you set up during installation.
- One IntelliPrint printer device, `/dev/xlps??`.

See Tables 3-1 and 3-2 in Chapter 3 for a complete listing of device names and a discussion of modem and non-modem devices.

/etc/ttytype Entries

For each port, the installation program adds an entry to the file `/etc/ttytype`, based on the terminal types you specified during installation. The device names listed here match the choices you made for the "Modem" and "Terminal Type" fields while running `mkdev fip`; for example, `/dev/ttyS00` if the port is intended for a modem.

/etc/inittab Entries

For each port, the installation program adds an entry to the file `/etc/inittab`, including the *getty* codes you specified during installation. The *getty* codes match the choices you made for the "Getty Code" field while running `mkdev fip`. These codes must be defined in the `/etc/gettydefs` file.

Installation Steps for SCO XENIX 386 (Release 2.3)

This section describes how to install the IntelliPort II software device drivers for SCO XENIX 386, Release 2.3. Before you begin, make sure that the operating system is installed and active on your system, and that you have the correct driver software for your operating system.

Starting Installation

1. Log onto your system as root and run the XENIX *custom* program. From the *custom* Main Menu, select the "Add a Supported Product" option.

2. When prompted for Distribution Volume 1, insert the *IntelliPort II Driver* diskette into the floppy drive and then press **ENTER**.

3. At the "Select an Option" prompt, choose "Install One or More Packages." At the "Enter Packages" prompt, type:

   ```
   ALL
   ```

   and then press **ENTER**.

4. When you are asked to insert the Computone Drivers Volume 1 diskette, just press **ENTER** (you already inserted this diskette in step 2).

Setting Controller Parameters

1. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

2. When the first Form Screen appears, do the following:

   - Indicate the number (1 - 4) of IntelliPort II controllers installed in the system.
   - Indicate the IRQ that the controllers are to use. Press **F2** to see a list of available IRQs. Write down the IRQ you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide*.

   Press **F3** to continue.

> **Important**: If you press **F2** and no interrupts are available, stop the installation immediately and call Computone Technical Support.

3. When the second Form Screen appears, do the following **for each controller**:

   - Specify the type of IntelliPort II controller that you are installing.
   - For ISA and Micro Channel controllers, specify the base I/O address that this controller is to use. Press **F2** to see a list of available I/O addresses. You must assign a unique base I/O address to each IntelliPort II controller. Write down the base I/O address you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide*.
   - For EISA controllers, specify the slot number that this controller is to use. Press **F2** to see a list of available slots. You must assign a unique slot to each IntelliPort II controller. Write down the slot number you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide*.

- Specify the maximum number of IntelliView screens to be accessible from attached terminals in the "Max Screens/Terminal" field. The following table shows valid selections.

Number of Screens	Enables IntelliView Main Screen plus
1	Zero (0) Alternate Screens
2	One (1) Alternate Screen
3	Two (2) Alternate Screens
4	Three (3) Alternate Screens
5	Four (4) Alternate Screens
6	Five (5) Alternate Screens
7	Six (6) Alternate Screens
8	Seven (7) Alternate Screens

This selection applies to all terminals attached to an IntelliPort II. You can assign fewer screens to individual terminals by assigning different profiles to each terminal.

Press **F3** to put your selections into effect.

If you specify four or more screens per terminal (one Main screen and three or more Alternate screens), the installation program prompts you to confirm the number of screens that you specified. Specifying a large number of screens can place a heavy burden on system resources; most terminals support three or fewer screens.

See Chapter 3 and Appendix A for more information on the IntelliView feature.

➡ **Note**: To change the maximum number of screens available, you must re-install the drivers.

4. If you are installing an IntelliPort II EXpandable, the installation program displays a screen that lets you enter the number of ports on each expansion module (up to four modules per controller). If you have less than four controllers, set the number of ports on the last modules to zero. Otherwise, enter 8 or 16 ports for each module as appropriate. Press **F3** to save your changes and continue.

6. For IntelliPort II ISA controllers, the installation program displays a window that shows how to set the I/O address DIP switch on each controller. As described in the *IntelliPort II Hardware Reference Guide*, you must set this DIP switch to match the I/O address selection that you made in step 3.

   The installation driver displays the following messages:

```
Removing old IntelliPort II driver
Building installation files...
Do you wish to relink the kernel now (y/n)?
```

7. Press **y** and **ENTER**. The installation program saves the old kernel as */xenix.old*.

   The installation program displays a list of IntelliPort files and IntelliFeature device assignments as they are written to your hard disk. See the section "How Installation Affects the System" for details.

➡ **Note**: IntelliFeature device assignments are described in detail in Chapter 3.

8. Press **ENTER** to continue. The following messages then appear:

```
Steps to complete installation:

Shut down your system and reboot to activate the new system.

Set up your terminals to match the baud rate, parity, data
bits, and stop bits defined in the /etc/gettydefs entry.

After rebooting, you need to type "/etc/mkdev fip" in order
to set up baud rates, terminal types, and IntelliView Screens.

Installation complete.  Press Enter to continue...
```

   See Appendix A for details about the `mkdev fip` command.

9. When the *custom* Main Menu reappears, type `Quit` and press **ENTER** to exit. The *custom* utility terminates and returns you to the XENIX shell prompt.

Setting Individual Port Parameters

The last phase of driver installation is to set individual port parameters. Follow these steps:

1. Remove the Computone diskette from the floppy disk drive and shut down the system using the command:

   ```
   shutdown 0
   ```

2. Power down the computer and install the IntelliPort II controller and interface modules as described in the *IntelliPort II Hardware Reference Guide.*

3. Start up the system and watch the status messages on the console. In particular, watch for messages dealing with the serial devices and the message "Initializing IntelliPort II boards." If anything goes wrong with the IntelliPort II, error messages generally show up following these messages.

   If the system boots correctly, proceed to Chapter 3, "System Administration." If any errors occur, or the system does not boot, proceed to Chapter 4, "Troubleshooting."

4. Type `/etc/mkdev fip` at the XENIX shell prompt and press **ENTER**.

5. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

6. When the first Form Screen appears, assign an IntelliCap profile entry to each port. The *dumb* setting specifies no IntelliFeatures; that is, no IntelliView Alternate screens or IntelliPrint. Press **F2** to see a list of available profiles.

   Press **F3** to continue to the next Form screen.

7. Specify the following parameters for each port (press **F2** to list choices for each parameter):

   - Choose the terminal type for each port in the "Terminal Type" field. The installation program writes terminal type selections to the file */etc/ttytype*.
   - Choose the login type for each port in the "Logins Enabled" field. Choices are None (logins are disabled for the port), Main (logins are enabled only for the Main screen), and All (logins are enabled for the Main screen and all Alternate screens).
   - Indicate whether a modem is connected to each port in the "Modem" field. Choices are Yes and No.
   - Indicate the terminal communications entry for each port in the "Getty Code" field. The file */etc/gettydefs* contains the definitions of valid getty codes.

     Press **F3** to save your selections and continue.

   The installation program lists the files created or changed and builds the configuration files.

At this point, you should tune the operating system kernel to ensure that adequate system resources are available. See "Kernel Tuning Example" at the end of Chapter 3 for more information.

How Installation Affects the System

This section describes devices and entries added to various system files.

System Initialization

The IntelliPort II installation program adds a shell script called `fip_init` to the directory `/etc/rc.d/6`. This script runs `/etc/fipInit` to load the *intellicap*, *icap.site*, and *intellitype* parameter definitions.

Files

Besides the additions to `/etc` listed above, the installation program creates a directory `/etc/default/fip.d` that contains the default IntelliFeatures files. The following files are of interest:

FIP_NOTES, doc.intellicap	These files contain on-line information about the IntelliPort II drivers and IntelliFeatures.
intellicap	This is the default *intellicap* file. Avoid making changes to this file, since this file is replaced when you update or re-install the IntelliPort II drivers.
icap.site	Add site-specific IntelliFeatures profiles to this file. If you update or re-install the IntelliPort II drivers, the installation program leaves this file untouched.
fipNode.fi??	These are the nodefiles loaded by *fipInit* during system initialization.
mknod.fip	This is a shell script that contains commands used to generate the IntelliPort II *tty* devices.

You can edit the *icap.site* file as needed to add new IntelliCap profiles to your system. Do not modify the other files except when directed by Computone Technical Support.

tty Devices

For each IntelliPort II port, the installation program creates the following tty devices:

- One non-modem device, `/dev/ttys??`.
- One modem device, `/dev/ttyS??`.
- Zero or more virtual devices, `/dev/tty`**N**`??`, depending on the value of "Max Screens/Terminal" you entered during installation. **N** is in the range [T-Z], depending on how many Alternate screens you set up during installation.
- One IntelliPrint printer device, `/dev/xlps??`.

See Tables 3-1 and 3-2 in Chapter 3 for a complete listing of device names.

/etc/ttytype Entries

For each port, the installation program adds an entry to the file `/etc/ttytype`, based on the terminal types you specified during installation. The device names match the choices you made for the "Modem" and "Terminal Type" fields while running `mkdev fip`; for example, `/dev/ttyS00` if this port is intended for a modem.

/etc/inittab Entries

For each port, the installation program adds an entry to the file `/etc/inittab`, including the *getty* codes you specified during installation. The *getty* codes match the choices you made for the "Getty Code" field while running `mkdev fip`. These codes must be defined in the `/etc/gettydefs` file.

➡ **Note**: The IntelliPort II installation program adds entries to the `/etc/inittab` file only for compatibility reasons. This file is generally not used by XENIX applications.

/etc/ttys Entries

For each port, the installation program adds an entry to the file `/etc/ttys`, including the login and *getty* codes you specified during installation. The login codes match the choices you made for the "Logins Enabled" field while running `mkdev fip`. The *getty* codes match the choices you made for the "Getty Code" field while running `mkdev fip`. These codes must be defined in the `/etc/gettydefs` file.

Combined Installation Steps for:

AT&T/USL UNIX V (Release 3.2)

ESIX UNIX V (Release 3.2)

Intel System V UNIX (Release 3.2)

Interactive UNIX 386/ix (Release 3.2)

This section describes how to install the IntelliPort II software device drivers for UNIX System V, Release 3.2, and for derivative operating systems. Before you begin, make sure that the operating system is installed and active on your system. Installing drivers also requires that the kernel configuration package be installed on your system.

Starting Installation

1. Log onto your system as root and make a back-up copy of your system kernel. For example, you might use the command:

   ```
   cp /unix /old_unix
   ```

2. Start up the System Administration program by entering the command:

   ```
   sysadm
   ```

3. From the System Administration Menu, select "softwaremgmt." From the System Management Menu, select "installpkg."

4. Indicate the drive type and density. The default is 5-1/4" high density.

5. When prompted to do so, put the *Computone IntelliPort II Driver* diskette into the floppy drive, then follow the instructions on the screen.

Setting Controller Parameters

1. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

2. When the first Form Screen appears, do the following:

   - Indicate the number (1 - 4) of IntelliPort II controllers installed in the system.
   - Indicate the IRQ that the controllers are to use. Press **F2** to see a list of available IRQs. Write down the IRQ you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide.*

   Press **F3** to continue.

> **Important**: If you press **F2** and no interrupts are available, stop the installation immediately and call Computone Technical Support.

3. When the second Form Screen appears, do the following for each controller:

   - Specify the type of IntelliPort II controller that you are installing.
   - For ISA and Micro Channel controllers, specify the base I/O address that this controller is to use. Press **F2** to see a list of available I/O addresses. You must assign a unique base I/O address to each IntelliPort II controller. Write down the base I/O address you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide.*
   - For EISA controllers, specify the slot number that this controller is to use. Press **F2** to see a list of available slots. You must assign a unique slot to each IntelliPort II controller. Write down the slot number you choose in the Hardware Reference Log in Appendix A of the *IntelliPort II Hardware Reference Guide.*

- Specify the maximum number of IntelliView screens to be accessible from attached terminals in the "Max Screens/Terminal" field. The following table shows valid selections.

Number of Screens	Enables IntelliView Main Screen plus
1	Zero (0) Alternate Screens
2	One (1) Alternate Screen
3	Two (2) Alternate Screens
4	Three (3) Alternate Screens
5	Four (4) Alternate Screens
6	Five (5) Alternate Screens
7	Six (6) Alternate Screens
8	Seven (7) Alternate Screens

This selection applies to all terminals attached to an IntelliPort II. You can assign fewer screens to individual terminals by assigning different profiles to each terminal.

Press **F3** to put your selections into effect.

If you specify four or more screens per terminal (one Main screen and three or more Alternate screens), the installation program prompts you to confirm the number of screens that you specified. Specifying a large number of screens can place a heavy burden on system resources; most terminals support three or fewer screens.

See Chapter 3 and Appendix A for more information on the IntelliView feature.

➡ **Note**: To change the maximum number of screens available, you must re-install the drivers.

4. If you are installing an IntelliPort II EXpandable, the installation program displays a screen that lets you enter the number of ports on each expansion module (up to four modules per controller). If you have less than four controllers, set the number of ports on the last modules to zero. Otherwise, enter 8 or 16 ports for each module as appropriate. Press **F3** to save your changes and continue.

5. For IntelliPort II ISA controllers, the installation program displays a window that shows how to set the I/O address DIP switch on each controller. As described in the *IntelliPort II Hardware Reference Guide*, you must set this DIP switch to match the I/O address selection that you made in step 3.

The installation driver displays the following messages:

```
Removing old IntelliPort II driver
Building installation files...
Do you wish to relink the kernel now (y/n)?
```

6. Press **y** and **ENTER** to continue.

   The operating system kernel is then rebuilt (the old kernel is saved as `o_unix`).

   The installation program displays a list of IntelliPort files and IntelliFeature device assignments as they are written to your hard disk. A summary of these files and device assignments can be found in the following:

   /etc/default/fip.d/intellitype
   /etc/default/fip.d/intellicap
   /etc/inittab (System Initialization Table)
   /etc/ttytype (Terminal Types)

➡ **Note**: IntelliFeatures device assignments are described in detail in Chapter 3.

7. Press **ENTER** to continue. The following messages then appear:

```
Steps to complete installation:

Shut down your system and reboot to activate the new system.

Set up your terminals to match the baud rate, parity, data
bits, and stop bits defined in the /etc/gettydefs entry.

After rebooting, you need to type "/etc/mkdev fip" in order
to set up baud rates, terminal types, and IntelliView Screens.

Installation complete.  Press Enter to continue...
```

   See Appendix A for details about the `mkdev fip` command.

8. Exit the System Administration program.

Setting Individual Port Parameters

The last phase of driver installation is to set individual port parameters. Follow these steps:

1. Remove the Computone diskette from the floppy disk drive (if you have not already removed it) and shut down the system using the command:

   ```
   shutdown -g0
   ```

   (Interactive systems automatically shut down the system at this point.)

2. Power down the computer and install the IntelliPort II controller and interface modules as described in the *IntelliPort II Hardware Reference Guide*.

3. Start up the system and watch the status messages on the console. In particular, watch for messages dealing with the serial devices and the message "Initializing IntelliPort II boards." If anything goes wrong with the IntelliPort II, error messages generally show up following these messages.

   If the system boots correctly, proceed to step 4. If any errors occur, or the system does not boot, proceed to Chapter 4, "Troubleshooting."

4. Type `/etc/mkdev fip` at the UNIX shell prompt and press **ENTER**.

5. Wait for the following message to appear:

   ```
   IntelliPort II Installation Program
   ```

   Press any key to continue.

6. When the first Form Screen appears, assign an IntelliCap profile entry to each port. The *dumb* setting specifies no IntelliFeatures; that is, no IntelliView Alternate screens or IntelliPrint. Press **F2** to see a list of available profiles.

   Press **F3** to continue to the next Form screen.

7. Specify the following parameters for each port (press **F2** to list choices for each parameter):

   - Choose the terminal type for each port in the "Terminal Type" field. The installation program writes terminal type selections to the file */etc/ttytype*.
   - Choose the login type for each port in the "Logins Enabled" field. Choices are None (logins are disabled for the port), Main (logins are enabled only for the Main screen), and All (logins are enabled for the Main screen and all Alternate screens).
   - Indicate whether a modem is connected to each port in the "Modem" field. Choices are Yes and No.
   - Indicate the terminal communications entry for each port in the "Getty Code" field. The file */etc/gettydefs* contains the definitions of valid getty codes.

     Press **F3** to save your selections and continue.

   The installation program lists the files created or changed and builds the configuration files.

At this point, you should tune the operating system kernel to ensure that adequate system resources are available. See "Kernel Tuning Example" at the end of Chapter 3 for more information.

How Installation Affects the System

This section describes devices and entries added to various system files.

System Initialization

The IntelliPort II installation program adds a shell script called `S35fip_init` to the directory `/etc/rc2.d`. This script runs `/etc/fipInit` to load the *intellicap, icap.site,* and *intellitype* parameter definitions.

Files

Besides the additions to `/etc` noted above, the installation program creates a directory `/etc/default/fip.d` that contains the default IntelliFeatures files. The following files are of interest:

FIP_NOTES, doc.intellicap	These files contain on-line information about the IntelliPort II drivers and IntelliFeatures.
intellicap	This is the default *intellicap* file. Avoid making changes to this file, since this file is replaced when you update or re-install the IntelliPort II drivers.
icap.site	Add site-specific IntelliFeatures profiles to this file. If you update or re-install the IntelliPort II drivers, the installation program leaves this file untouched.
fipNode.fi??	These are the nodefiles loaded by fipInit during system initialization.
/etc/mkdev (Interactive)	For Interactive systems only, the IntelliPort II installation program creates a shell script called /etc/mkdev. This file is included for compatibility with other UNIX systems that have the /etc/mkdev utility as a standard part of the operating system.

You can edit the *icap.site* file as needed to add new IntelliCap profiles to your system. Do not modify the other files unless directed to do so by Computone Technical Support.

tty Devices

For each IntelliPort II port, the installation program creates the following tty devices:

- One non-modem device, `/dev/ttys??`.
- One modem device, `/dev/ttyS??`.
- Zero or more virtual devices, `/dev/tty`**N**`??`, depending on the value of "Max Screens/Terminal" you entered during installation. **N** is in the range [T-Z], depending on how many Alternate screens you set up during installation.
- One IntelliPrint printer device, `/dev/xlps??`.

See Tables 3-1 and 3-2 in Chapter 3 for a complete listing of device names.

/etc/ttytype Entries

For each port, the installation program adds an entry to the file `/etc/ttytype`, based on the terminal types you specified during installation. The device names listed here match the choices you made for the "Modem" and "Terminal Type" fields while running `mkdev fip`; for example, `/dev/ttyS00` if this port is intended for a modem.

/etc/inittab Entries

For each port, the installation program adds an entry to the file `/etc/inittab`, including the *getty* codes you specified during installation. The *getty* codes match the choices you made for the "Getty Code" field while running `mkdev fip`. These codes must be defined in the `/etc/gettydefs` file.

Chapter 3
System Administration

The IntelliPort II provides users and system administrators with many enhancements over a generic serial tty device. Users can take advantage of multiple screens and local printers, while system administrators can easily modify the configuration of each IntelliPort II terminal.

This chapter discusses the following topics:

- IntelliFeatures overview
- Modifying IntelliFeatures
- IntelliFeature device assignments
- Changing terminal configuration
- Tuning the kernel

IntelliFeatures Overview

Computone's exclusive IntelliFeatures are designed to let users and system administrators work more quickly and efficiently. Currently, the supported IntelliFeatures are:

- **IntelliView,** which lets users access a Main screen and up to seven Alternate screens from their terminal or workstation.
- **IntelliPrint,** which lets users transparently access a printer attached to the AUX port of a terminal.
- **IntelliSet,** which is used to adjust Computone hardware-related settings as data rate, flow control, and the like.

Since IntelliFeatures are an enhancement to the standard operating system interface, they are limited by your choice of terminals and peripherals, configuration options, and the applications that you are using. The following sections describe individual IntelliFeatures and their limitations.

IntelliView

IntelliView lets a terminal with multi-page memory display up to eight different screens, letting users instantly toggle from one screen to another. The maximum number of screens supported by each IntelliPort II controller is specified during software installation (Chapter 2). To change the maximum number of screens supported, you must re-install the drivers.

IntelliView supports a Main screen and up to seven Alternate screens on each terminal or workstation that is connected to an IntelliPort II. IntelliView scans incoming keys for special sequences (generally sent by function keys) which the user presses to switch from screen to screen.

➡ **Note**: If you enable several IntelliView Alternate screens, you should tune the operating system kernel to ensure that there are adequate system resources available. See the section "Tuning the Kernel" later in this chapter for more information.

IntelliView Limitations

Keep the following in mind when using IntelliView:

- Most terminals that support multiple screens support a maximum of up to four screens (the Main screen and three Alternate screens).
- Some applications may:
  - Use Alternate screens for additional information storage
  - Use the same function keys or sequences that IntelliView uses to toggle from screen to screen
  - Reset the terminal to memory page #0 during start up
  - Clear all of the terminal's memory pages during start up

If you run short of kernel memory, reinstall the software and select a smaller number of IntelliView Alternate screens.

Differences from older IntelliPort Implementations

- IntelliView now supports more screens (provided the terminal has enough multi-page memory to support them).
- IntelliView supports a function key to select the next screen. You can use this to supplement or replace function keys that select specific screens.
- If a terminal is assigned to a profile that includes IntelliView, but only the Main screen is opened (e.g., logins for Alternate screen devices are disabled), IntelliView does not scan for incoming screen toggle control sequences.

As previously discussed, each IntelliPort II user can access an IntelliView Main screen and up to seven IntelliView Alternate screens. The Main screen and Alternate screens are treated by UNIX and XENIX as separate devices, even though they share the same physical port.

The number of IntelliView screens that can be used is affected by two important factors:

- The terminal must have multi-page memory capability.
- The number of Alternate screens may be limited by system resources, and may require some tuning of the system kernel.

Each IntelliView Main screen and Alternate screen has its own *tty* structure. This structure includes parameters such as data rate, line discipline options, and so forth.

Most *tty* parameters, including raw or cooked modes, can differ from one IntelliView screen to another. However, hardware-related parameters, such as data rate, word length, stop bits, parity, and flow control, **must** be identical. For this reason, only the IntelliView Main Screen can change the data rate or other properties of the physical link.

You can define the IntelliView Main screen as either a modem or non-modem device. All of the Alternate screens on a given port behave in the same manner (modem or non-modem) as the Main screen for that port. The difference between modem and non-modem devices is discussed in the "IntelliPort Device Assignments" section later in this chapter.

Sometimes a system is configured so that an intentional logout (e.g., **CTRL-D** at the shell prompt) causes the host to drop DTR, disconnecting any modems. Only a logoff from the IntelliView Main screen can cause such a disconnect; logging off from an IntelliView Alternate screen simply activates the Main screen, as though a Hot Key toggle sequence had been sent.

IntelliPrint

IntelliPrint lets users transparently access the AUX (auxiliary) port present on many terminals. A printer connected to a serial or parallel AUX port appears to the system as a separate device.

IntelliPrint multiplexes data between the terminal's screen and the printer. Control sequences, inserted by IntelliPrint and supported by the terminal, determine whether data should be routed to the screen or to the printer.

IntelliPrint Limitations

The following items should be considered when using IntelliPrint:

- Some terminals do not have an AUX port.
- Some applications may attempt to send data directly to the AUX port, usually to support a similar function. This could cause conflicts with IntelliPrint; however, IntelliPrint is designed to minimize this possibility.

Differences from older IntelliPort Implementations

The IntelliPrint devices are automatically enabled during installation. To make use of the device, you must select a terminal profile that supports an auxiliary printer for that terminal type.

IntelliSet

IntelliSet lets you select data rate, flow control, and similar hardware-related features that are not directly supported by the operating system or device drivers. You can lock individual parameters in place, or specify them as defaults that can be subsequently changed.

IntelliSet may be used in combination with other features; all virtual devices are affected. IntelliSet is used in conjunction with the *intellicap* and *intellitype* files. For more information on these files, see Appendix A.

IntelliSet Limitations

When using IntelliSet, keep the following limitations in mind:

- Due to hardware dependencies, not all parameters are supported by all drivers. Some values may not be supported for a given parameter.

  Read the file FIP_NOTES in `/etc/default/fip.d` (or `ip2.d`) for a list of the IntelliSet parameters supported by your driver.

- When device driver support is available, it is always installed since it does not require significant kernel memory.

Modifying IntelliFeatures

The *intellicap* file contains the default IntelliFeatures profiles. Each profile specifies the IntelliFeatures that apply to a specific terminal, such as:

- The number of IntelliView screens that the terminal supports
- Whether the terminal supports IntelliPrint
- IntelliSet parameters (data rate, parity, flow control, and similar hardware items)

See "Changing Terminal Configuration" later in this chapter for information on how to assign IntelliFeatures profiles to each port.

If the *intellicap* file does not contain a profile that matches your needs, you can add customized profiles to the *icap.site* file. Do not modify the *intellicap* file, since the installation utility overwrites this file if you reinstall or upgrade the IntelliPort II drivers. For information about the format of the *intellicap* and *icap.site* files, see Appendix A.

After modifying the *icap.site* file, run the shell script */etc/fip_reinit* (or */etc/ip2_reinit*, for SVR4 systems) to make the new profiles available for use.

Notes on IntelliPrint Usage

IntelliPrint is designed to circumvent the following situations:

- Each terminal with an auxiliary port recognizes "switch output" commands to redirect output to the screen or port. If this command were to be sent in the middle of, for example, a "reposition cursor" command, the terminal would most likely not recognize either command. In this situation, data meant for the printer could appear on the screen and vice versa.

  IntelliPrint addresses this problem by assuming that applications send an entire command sequence at once. To guarantee that IntelliPrint does not begin sending data in the middle of a command sequence, it waits until no data has been sent to the terminal for the length of time specified by the "startdelay" parameter (from 1/10 second to 10 seconds). After the line has been quiet for this length of time, IntelliPrint sends a block of data to the printer with the appropriate "start printer" and "stop printer" commands. The amount of delay required depends on system load, data rate, and the maximum length of a command sequence.

- If the printer receives data faster than it can print, the printer's internal data buffers start to fill up and the printer sends an XOFF or drops the flow control line to the terminal. At this point, the terminal begins buffering data to the printer. If the buffers fill up, the terminal sends an XOFF or drops the flow control line to the host. At this point, neither the terminal nor the printer receives any data until the printer is ready to receive more data.

  IntelliPrint addresses this situation by pacing the flow of data to the printer, inserting a minimum delay between blocks of printer data, so that the printer never needs to block data coming from the terminal. This delay is determined by the "pause" parameter (from 1/10 second to 5 seconds). The amount of delay required depends on several factors, including printing speed, data rate, the printer's buffer size, and usage.

You should experiment with the values of "startdelay" and "pause" to find out what works best on your system. Figure 3-1 is a timeline showing how IntelliPrint routes data.

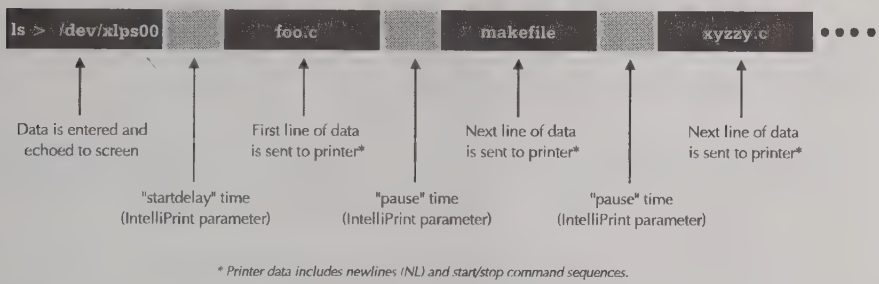
ls > /dev/xlps00
foo.c
makefile
xyzzy.c
Data is entered and echoed to screen
First line of data is sent to printer*
Next line of data is sent to printer*
Next line of data is sent to printer*
"startdelay" time (IntelliPrint parameter)
"pause" time (IntelliPrint parameter)
"pause" time (IntelliPrint parameter)
* Printer data includes newlines (NL) and start/stop command sequences.

Figure 3-1. IntelliPrint Behavior as a Function of Time

There are two situations that IntelliPrint cannot reasonably handle, due to the limitations imposed by most hardware. These are as follows:

- If you take the auxiliary printer off-line without powering it down, the printer automatically blocks incoming data. If IntelliPrint tries to send data to the printer, the terminal eventually asserts flow control and blocks both screen and printer data.

  The only solution is to turn off the printer whenever you need to take it off-line.

- If you send graphics to the printer, the graphical data may contain a sequence of characters identical to the "printer off" command sequence. If this sequence is contained within graphical data, subsequent printer data is sent to the screen garbling both screen and printer output.

  The solution is to either make sure you send only text to the printer, or use a PostScript™ or other printer that uses printable command sequences.

IntelliFeatures Device Assignments

When you install the Computone software (Chapter 2), the installation program creates up to nine serial *tty* (major) devices for each IntelliPort II port in your system. (UNIX/XENIX major devices are described in your operating system documentation.)

The actual number of *tty* devices that are created depends on the number of ports the IntelliPort II provides, and how many IntelliView screens you enable during device driver installation.

For example, you might install one 8-port IntelliPort II controller. During software installation, you enable eight IntelliView screens (the Main Screen plus all seven Alternate Screens). As a result, the installation program creates the following *tty* devices for each concentrator port:

- One *tty* modem device for the IntelliView Main Screen (see "Modem vs. Non-Modem Devices" on the next page)
- One *tty* non-modem device for the IntelliView Main Screen (see "Modem vs. Non-Modem Devices" on the next page)
- One *tty* device for IntelliView Alternate Screen #1
- One *tty* device for IntelliView Alternate Screen #2
- One *tty* device for IntelliView Alternate Screen #3
- One *tty* device for IntelliView Alternate Screen #4
- One *tty* device for IntelliView Alternate Screen #5
- One *tty* device for IntelliView Alternate Screen #6
- One *tty* device for IntelliView Alternate Screen #7
- One *tty* device for IntelliPrint (this device is named */dev/xlpsxx* and is always created).

This section describes the difference between modem and non-modem devices.

➡ **Note**: When you specify the device for the IntelliView Main screen as either modem or non-modem, **all of the Alternate screens on that same physical port behave in the same manner**.

For example, if you specify the Main screen for controller port #2 as a non-modem device, all of the Alternate screens on port #2 also function as non-modem devices.

Data Terminal Ready (DTR) and Carrier Detect (CD). UNIX and XENIX support two data set signals that indicate whether a physical connection has been made or broken: Data Terminal Ready (**DTR**) and Carrier Detect (**CD**).

- **DTR**, an output signal, is asserted whenever a host port is opened, and is usually dropped when the port is closed. DTR can also be toggled under software control.

  DTR informs attached devices such as modems that a given process is ready to listen to incoming data. A modem or other device might not answer an incoming call unless DTR is asserted.

- **CD**, an input signal, indicates whether an attached device has an active connection. For example, a modem asserts CD when it senses another modem at the other end of the phone line.

The IntelliPort II driver installation utility provides two device names for each serial port: one for a modem device, and one for a non-modem device. A modem device uses the CD signal, while a non-modem device ignores it.

Using IntelliView Modem Devices. When you are using modem devices, you must ensure that the CD pin in your cable is connected, as described below.

- When connecting to a modem, the CD input signal must be connected to the modem's CD output. Logins wait until an incoming call is established before sending the login prompt. If the call is disconnected, you are logged off, and any programs that you are running receive a HUP (hangup) signal.

- When connecting to a terminal, the CD input must be connected to the terminal's DTR output. Logins wait until the terminal is powered up before the login prompt is sent. When the terminal is powered off, the system responds just as it would to a modem disconnect.

Some software and utilities supplied with your system may temporarily override these rules. For example, once running, some programs may tell a modem device to ignore loss of carrier. Other programs (e.g., dialers) are written especially to open and use a modem device, even when no carrier is present.

In summary, you should use a modem device when:

- You are connecting a modem to the port; or

- You want sessions to automatically log off whenever the connected terminal is powered off.

Using IntelliView Non-Modem Devices. Sometimes you may want to connect terminals using only three signals: TxD, RxD, and Ground. If this is the case, you must use a non-modem device.

With a non-modem device, the system has no way of knowing if the terminal is powered off. For example, if you power off unexpectedly, your application may continue to display data, wait for input, and so on. When you power on your terminal, the screen is blank, but the application assumes everything is still intact, creating a confusing display. You can avoid this potential problem by leaving your terminal on while you are logged in.

In summary, you should use a non-modem device when:

- CD is not connected; or
- You do *not* want to automatically log off whenever your terminal is powered off.

tty Device Names

The *tty* device names for up to four IntelliPort II EX controllers are listed in Tables 3-1 and 3-2. In these tables, the following holds true:

- The devices for the IntelliView Main screen are referred to as modem and non-modem. Information on modem and non-modem devices is provided earlier in this chapter.
- The last two digits of each device name represent the port number (in hexadecimal).

  For example, the IntelliPrint device on port #0 (the first port on controller #1) is named */dev/xlps**00*** while the IntelliPrint device on port #255 (the last port on controller #4) is named */dev/xlps**ff***.
- In Table 3-1, the device name ranges assume you are installing an IntelliPort II EXpandable with four 16-port expansion modules.

  The installation utility actually creates a number of device names based on the number of ports specified during installation.
- In Table 3-2, the device name ranges assume you are installing a 16-port IntelliPort II controller.

  For an 8-port IntelliPort II controller, device assignments for the Main Screen (for the first controller) run from */dev/ttys00* to */dev/ttys07* for non-modem devices, and from */dev/ttyS00* to */dev/ttyS07* for modem devices. This also holds true for subsequent controllers, for Alternate Screens 1 through 7, and for the IntelliPrint devices.

  For a 4-port IntelliPort II controller, device assignments for the Main Screen (for the first controller) run from */dev/ttys00* to */dev/ttys03* for non-modem devices, and from */dev/ttyS00* to */dev/ttyS03* for modem devices. This also holds true for subsequent controllers, for Alternate Screens 1 through 7, and for the IntelliPrint devices.

Table 3-1. IntelliPort II EXpandable Device Assignments

	Controller #1 (ports 0 to 63)	Controller #2 (ports 64 to 127)	Controller #3 (ports 128 to 191)	Controller #4 (ports 192 to 255)
Main Screen				
Non-modem device name	/dev/ttys00 - /dev/ttys3f	/dev/ttys40 - /dev/ttys7f	/dev/ttys80 - /dev/ttysbf	/dev/ttysc0 - /dev/ttysff
Modem device name	/dev/ttyS00 - /dev/ttyS3f	/dev/ttyS40 - /dev/ttyS7f	/dev/ttyS80 - /dev/ttySbf	/dev/ttyScO - /dev/ttySff
Alternate Screen #1				
Device name	/dev/ttyT00 - /dev/ttyT3f	/dev/ttyT40 - /dev/ttyT7f	/dev/ttyT80 - /dev/ttyTbf	/dev/ttyTc0 - /dev/ttyTff
Alternate Screen #2				
Device name	/dev/ttyU00 - /dev/ttyU3f	/dev/ttyU40 - /dev/ttyU7f	/dev/ttyU80 - /dev/ttyUbf	/dev/ttyUc0 - /dev/ttyUff
Alternate Screen #3				
Device name	/dev/ttyV00 - /dev/ttyV3f	/dev/ttyV40 - /dev/ttyV7f	/dev/ttyV80 - /dev/ttyVbf	/dev/ttyVc0 - /dev/ttyVff
Alternate Screen #4				
Device name	/dev/ttyW00 - /dev/ttyW3f	/dev/ttyW40 - /dev/ttyW7f	/dev/ttyW80 - /dev/ttyWbf	/dev/ttyWc0 - /dev/ttyWff
Alternate Screen #5				
Device name	/dev/ttyX00 - /dev/ttyX3f	/dev/ttyX40 - /dev/ttyX7f	/dev/ttyX80 - /dev/ttyXbf	/dev/ttyXc0 - /dev/ttyXff
Alternate Screen #6				
Device name	/dev/ttyY00 - /dev/ttyY3f	/dev/ttyY40 - /dev/ttyY7f	/dev/ttyY80 - /dev/ttyYbf	/dev/ttyYc0 - /dev/ttyYff
Alternate Screen #7				
Device name	/dev/ttyZ00 - /dev/ttyZ3f	/dev/ttyZ40 - /dev/ttyZ7f	/dev/ttyZ80 - /dev/ttyZbf	/dev/ttyZc0 - /dev/ttyZff
IntelliPrint				
Device name	/dev/xlps00 - /dev/xlps3f	/dev/xlps40 - /dev/xlps7f	/dev/xlps80 - /dev/xlpsbf	/dev/xlpsc0 - /dev/xlpsff

Table 3-2. Standard IntelliPort II Device Assignments

	Controller #1 (ports 0 to 15)	Controller #2 (ports 16 to 31)	Controller #3 (ports 32 to 47)	Controller #4 (ports 48 to 63)
Main Screen				
Non-modem device name	/dev/ttys00 - /dev/ttys0f	/dev/ttys40 - /dev/ttys4f	/dev/ttys80 - /dev/ttys8f	/dev/ttysc0 - /dev/ttyscf
Modem device name	/dev/ttyS00 - /dev/ttyS0f	/dev/ttyS40 - /dev/ttyS4f	/dev/ttys80 - /dev/ttyS8f	/dev/ttyScO - /dev/ttyScf
Alternate Screen #1				
Device name	/dev/ttyT00 - /dev/ttyT0f	/dev/ttyT40 - /dev/ttyT4f	/dev/ttyT80 - /dev/ttyT8f	/dev/ttyTc0 - /dev/ttyTcf
Alternate Screen #2				
Device name	/dev/ttyU00 - /dev/ttyU0f	/dev/ttyU40 - /dev/ttyU4f	/dev/ttyU80 - /dev/ttyU8f	/dev/ttyUc0 - /dev/ttyUcf
Alternate Screen #3				
Device name	/dev/ttyV00 - /dev/ttyV0f	/dev/ttyV40 - /dev/ttyV4f	/dev/ttyV80 - /dev/ttyV8f	/dev/ttyVc0 - /dev/ttyVcf
Alternate Screen #4				
Device name	/dev/ttyW00 - /dev/ttyW0f	/dev/ttyW40 - /dev/ttyW4f	/dev/ttyW80 - /dev/ttyW8f	/dev/ttyWc0 - /dev/ttyWcf
Alternate Screen #5				
Device name	/dev/ttyX00 - /dev/ttyX0f	/dev/ttyX40 - /dev/ttyX4f	/dev/ttyX80 - /dev/ttyX8f	/dev/ttyXc0 - /dev/ttyXcf
Alternate Screen #6				
Device name	/dev/ttyY00 - /dev/ttyY0f	/dev/ttyY40 - /dev/ttyY4f	/dev/ttyY80 - /dev/ttyY8f	/dev/ttyYc0 - /dev/ttyYcf
Alternate Screen #7				
Device name	/dev/ttyZ00 - /dev/ttyZ0f	/dev/ttyZ40 - /dev/ttyZ4f	/dev/ttyZ80 - /dev/ttyZ8f	/dev/ttyZc0 - /dev/ttyZcf
IntelliPrint				
Device name	/dev/xlps00 - /dev/xlps0f	/dev/xlps40 - /dev/xlps4f	/dev/xlps80 - /dev/xlps8f	/dev/xlpsc0 - /dev/xlpscf

Changing Terminal Configuration

Different types of terminals have different capabilities and often use different control sequences. For this reason, IntelliFeatures options are organized into a number of different **profiles**, each of which corresponds to some specific terminal, printer, or other peripheral.

This section lists the IntelliFeatures profile definition files and describes how to apply profiles to ports.

➡ **Note**: Detailed descriptions of *intellicap*, *intellitype*, and *fipInit* are included in Appendix A.

Profile Definition Files

For UNIX SVR4.0 and SVR4.2 systems, the default IntelliFeatures profiles are stored in:

/etc/default/ip2.d/intellicap	(Computone-defined profiles)
/etc/default/ip2.d/icap.site	(user-defined profiles)

For other systems, the default IntelliFeature profiles are stored in:

/etc/default/fip.d/intellicap	(Computone-defined profiles)
/etc/default/fip.d/icap.site	(user-defined profiles)

A shell script, */etc/ip2_reinit* (SVR4) or */etc/fip_reinit* (other) runs the *ip2Init* (or *fipInit*) utility at system startup to load the *intellicap*, *icap.site*, and *intellitype* files. You can run the *ip2Init* or *fipInit* utility at other times to change the available IntelliFeatures profiles. See Appendix A for more information on *ip2Init* and *fipInit*.

Changing Terminal Definitions

The assignment of a profile to a specific device is recorded in an *intellitype* file. The default file is located in:

/etc/default/ip2.d/intellitype (SVR4)
/etc/default/fip.d/intellitype (others)

Related system initialization and definition files can be found in:

/etc/inittab (system initialization table)
/etc/ttytype (terminal types)
/etc/ttys (terminal settings, XENIX 386 only)

During installation, the *mkdev fip* or *ip2_sysadm* utility creates the initial entries in these files for IntelliPort II ports. You can edit each of these files individually to change the configuration of each port (see the sections following), or you can run */etc/ip2_sysadm* (SVR4) or */etc/mkdev fip* (others) to interactively configure all the ports and automatically update the files. See Appendix A for details about *ip2_sysadm* and *mkdev fip*.

Modifying */etc/inittab* Entries

Each entry in the */etc/inittab* file consists of four fields, separated by colons. You can use *mkdev fip* or *ip2_sysadm* to automatically modify these entries, or you can edit them manually.

> **Important**: If you choose to manually edit */etc/inittab*, be sure to modify *only* the entries for IntelliPort II ports. We recommend that you use *mkdev fip* or *ip2_sysadm* to make changes.

In general, the only parts of the */etc/inittab* entries that you should modify are the last two fields. The third field can be either `respawn` to activate a login process or `off` to disable logins on this port. In the last field, you should modify only the last part (the *getty* code). See the system documentation for a detailed description of the */etc/inittab* file.

Modifying */etc/ttytype* Entries

Each entry in the */etc/ttytype* file contains two fields, separated by spaces. The first field identifies the terminal type (terminal types are usually defined in */etc/termcap*), while the second field identifies the device name that corresponds to the port.

```
ansi      console
w1        ttys00
vt100     ttys03
```

> **Important**: If you choose to manually edit */etc/ttytype*, avoid modifying the `console` entry. Under any circumstances, we recommend that you use *mkdev fip* or *ip2_sysadm* to make changes.

Modifying */etc/ttys* Entries (SCO XENIX 386 only)

Each entry in the */etc/ttys* file is of the following format:

*ab***tty***nnn*

where:

a	Indicates whether the device is enabled (1) or disabled (0).
b	Maps to an entry in the */etc/gettydefs* file, which contains device-specific operational information (e.g., baud rate).
tty*nnn*	Is the device number (e.g., *ttys00*).

Examples of three */etc/ttys* file entries are:

```
1cConsole
10ttys00
1ottys03
```

Important: If you choose to manually edit */etc/ttys*, avoid modifying the `Console` entry. Under any circumstances, we recommend that you use *mkdev fip* or *ip2_sysadm* to make changes.

For these three sample entries, the following holds true:

1. The first entry (`1cConsole`) identifies the system console, and should not be altered in any way.

2. The second entry (`10ttys00`) indicates that device /dev/ttys00 is enabled, and is mapped to entry 0 (that is, zero) in */etc/gettydefs*.

3. The third entry (`1ottys03`) indicates that device /dev/ttys03 is enabled, and is mapped to entry o (that is, lowercase O) in */etc/gettydefs*.

Modifying User *.profile* Files

If you want the system to use the terminal type specified in */etc/ttytype* (rather than usual *ansi* default definition), you should modify each user's *.profile* file.

The *.profile* file should contain a line similar to:

```
eval 'tset -m ansi:ansi -m /?ansi -r -s Q'
```

or:

```
eval 'tset -m :\?ansi -r -s Q'
```

Using the */etc/ttytype* Entry

To change the terminal type from *ansi* to the type defined in */etc/ttytype*, modify this line as follows:

```
eval 'tset -r -s -Q'
```

This is the best method for users who do not use dialup lines to access the host, or who always use the same type of terminal for both local and remote access.

Prompting for the Terminal Type

To prompt the user for the terminal type at login time, change the *tset* line to the following:

```
eval 'tset -m :\?ansi -r -s -Q'
```

This is the best method for users who use dialup lines to access the host, or who use various terminals to access the host. The string "ansi" indicates the default terminal type; change this to the most commonly-used terminal type for each user.

If users log in most often from a particular terminal, but occasionally use a dialup line with a different terminal type, modify the *tset* line to look like the following:

```
eval 'tset -m dialup:\? -r -s -Q'
```

This prompts the user for the terminal type only if the user logs in from a dialup line. Otherwise, the system uses the */etc/ttytype* entry for the port.

Notes for Wyse 60 Terminals

For Wyse™ 60 terminals, use a *tset* line similar to the following:

```
eval 'tset -I -m ansi:ansi -r -s -Q'
```

The `-I` option prevents the system from sending the terminal initialization string to the terminal at login time. This avoids output confusion due to the initialization string changing page memory. You can use the `-I` option with any of the other *tset* lines shown previously.

Tuning the Kernel

After you install the IntelliPort II Device Drivers (as described in Chapter 2) and *before* you return your system to service, you should tune the operating system kernel to ensure that there are adequate system resources available.

The following sections provide example minimum values for several operating systems. These are typical for most installations. See your System Administrator's documentation for detailed descriptions of each tunable kernel parameter for your operating system.

SCO UNIX SVR3.2

The table below provides an example of **minimum** tuning parameter values for SCO UNIX SVR3.2.

To begin tuning the kernel, log in to the system as root and enter the following commands at the shell prompt:

```
cd /etc/conf/cf.d
./configure
```

See the *SCO UNIX System Administrator's Guide* for detailed information about kernel tuning parameters.

Recommended Tuning Parameters (performance-related)

NCALL = (6 to 8) * *Number of enabled IntelliView screens*
NHBUF = (8 to 10) * *Number of enabled IntelliView screens*
NBUF = 4 * NHBUF

➡ **Note**: The NHBUF parameter must be a power of 2.

Required Tuning Parameters (system resource related)

NFILE = 4 * *Number of enabled IntelliView screens*
NINODE = NFILE << NINODE << NS5INODE
NS5INODE = NINODE << NS5INODE
NREGION = 6 * *Number of enabled IntelliView screens*
NCLIST = 6 * *Number of enabled IntelliView screens*
NPROC = (5 or 6) * *Number of enabled IntelliView screens*

➡ **Note**: In SCO's descriptions of the above items, the term *users* correlates to the number of enabled IntelliView Screens.

SCO XENIX 386 (Release 2.3)

The table below provides an example of **minimum** tuning parameter values for SCO XENIX 386, release 2.3.

To begin tuning the kernel, log in to the system as root and enter the following commands at the shell prompt:

```
cd /usr/sys/conf
./configure
```

See Chapter 8 of the *XENIX System Administrator's Guide* for detailed information about kernel tuning parameters.

Recommended Tuning Parameters (performance-related)

NCALL = (6 to 8) * *Number of enabled IntelliView screens*
NHBUF = (8 to 10) * *Number of enabled IntelliView screens*
NBUF = 4 * NHBUF

➡ **Note**: The NHBUF parameter must be a power of 2.

Required Tuning Parameters (system resource related)

NFILE = 4 * *Number of enabled IntelliView screens*
NINODE = NFILE
NCLIST = 5 * *Number of enabled IntelliView screens*
NPROC = 5 * *Number of enabled IntelliView screens*

➡ **Note**: In SCO's descriptions of the above items, the term *users* correlates to the number of enabled IntelliView Screens.

Chapter 4
Troubleshooting

This chapter describes the software problems that may be encountered by Computone users, and provides solutions. This chapter covers the following information:

- Driver installation problems
- Booting problems
- Port problems

Driver Installation Problems

The problem in this section may occur while installing the IntelliPort II software drivers.

"No Interrupts Available" Message

During installation, the IntelliPort II installation program may not be able to allocate an IRQ for the controllers. The IntelliPort II controllers can use any of the following IRQs: 3, 4, 5, 7, 10, 11, 12, or 15. To make an interrupt available, you must remove the interrupt from another driver. IRQ 5 is often allocated for the second parallel port, but not actually used since most systems have only one parallel port.

If you need help removing drivers, call your operating system vendor's customer support. If all else fails, call Computone Technical Support.

> **Important**: Do NOT attempt to remove drivers or otherwise alter the kernel configuration unless you are *certain* you know what you are doing.

Linking Errors

Linking errors may occur near the end of the installation process, as the installation program attempts to link the new kernel. Follow these steps:

- **Verify that the LINK kit is installed.**
  - If the LINK kit is not installed, you must install the kit before you can install the IntelliPort II drivers. See your operating system documentation for details.

- **Reload the LINK kit.**
  - See your operating system documentation for details.
  - If you need more help, contact the operating system vendor's customer support.

- **Write down any error messages you see while the kernel is being rebuilt and call Computone Technical Support.**

Booting Problems

Booting problems are indicated by such messages as "Board is flashing an error" and "Error Initializing Board" during system boot. Check the following:

- **Check the LED on the end of the IntelliPort II controller.**
  - For IntelliPort II Micro Channel controllers, you must remove the system cover to see the LED. For IntelliPort II ISA and EISA controllers, the LED is on the outside edge of the controller.
  - See "LED Error Codes" in Chapter 5 of the *IntelliPort II Hardware Technical Reference* for information on interpreting the tri-color LED status sequences.

- **Try using a different IRQ.**
  - To use a different IRQ, you must reinstall the drivers (see Chapter 2, "Installation").
  - Reboot the system to see if the problem clears up. If not, proceed with the next step.

- **Try using a different I/O address.**
  - To use a different I/O address, you must reinstall the drivers (see Chapter 2, "Installation").
  - For ISA controllers, you must also remove the controller and set the DIP switches to correspond to the new I/O address. See "Setting I/O Address Switches" in Chapter 2 of the *IntelliPort II Hardware Technical Reference* for details.
  - Reboot the system to see if the problem clears up. If not, proceed with the next step.

- **Make sure you are booting from the kernel created during the IntelliPort II driver installation.**

- **Make sure the IntelliPort II controller is properly seated in its expansion slot.**

- **For IntelliPort II EXpandable controllers, make sure the expansion modules are properly connected to the controller.**

- **Reinstall the IntelliPort II software drivers.**
  - Reboot from the backup operating system kernel.
  - Reinstall the drivers as described in Chapter 2, "Installation."
- **If problems persist, write down any error messages and other symptoms and call Computone Technical Support.**

Port Problems

Port problems are those that appear after booting. No error message is given at boot time, but one or more ports may not function properly.

Problems with Logging On or Logging Off

Check the following:

- **Make sure the selected device name is appropriate for the connected hardware.**

  See the section "Modem Devices vs. Non-modem Devices" in Chapter 3 for details.

- **Recheck your installation selections and system files.**
  - Make sure the IntelliPort II software drivers and the controller configuration reference the same IRQ and I/O address. If necessary, reconfigure the drivers or the controller.
  - Make sure all the appropriate system files have been updated. See Chapter 3 for details.

- **Make sure the serial devices are properly configured.**
  - Make sure the serial devices are enabled.
  - Make sure the device settings (data rate, parity, etc.) match the system control files.

- **Check your cables.**
  - Make sure you are using the proper cables for the attached device. See the *IntelliPort II Hardware Technical Reference* for cabling details.
  - Make sure the cables are wired correctly, and have no breaks or shorts.

- **Reinstall the IntelliPort II software drivers.**
  - Reboot from the backup operating system kernel.
  - Reinstall the drivers as described in Chapter 2.
- **If problems persist, call Computone Technical Support.**

One or more Ports not Responding

This section covers troubleshooting procedures for instances where some ports work properly, but others do not. For each non-responding port, check the following:

- **Check your cables.**
  - Make sure you are using the proper cables for the attached device. See the *IntelliPort II Hardware Technical Reference* for cabling details.
  - Make sure the cables are wired correctly, and have no breaks or shorts.
  - Make sure the cables are properly shielded and do not exceed RS-232 length specifications.
- **Recheck your installation selections and system files.**
  - Make sure the IntelliPort II software drivers and the controller configuration reference the same IRQ and I/O address. If necessary, reconfigure the drivers or the controller.
  - Make sure all the appropriate system files have been updated. See Chapter 3 for details.
- **Make sure the serial devices are properly configured.**
  - Make sure the serial devices are enabled.
  - Make sure the device settings (data rate, parity, etc.) match the system control files.
- **Send data to the port to see whether the device receives the data.**
  - Use the command:
    `date > /dev/ttynnn`
    where *nnn* is the port number (for example, `dev ttys00`).

- **Make sure the selected device name is appropriate for the connected hardware.**

  See the section "Modem Devices vs. Non-modem Devices" in Chapter 3 for details.

- **Check the LED on the end of the IntelliPort II controller.**

  - For IntelliPort II Micro Channel controllers, you must remove the system cover to see the LED. For IntelliPort II ISA and EISA controllers, the LED is on the edge of the controller.
  - See "LED Error Codes" in Chapter 5 of the *IntelliPort II Hardware Technical Reference* for information on interpreting the tri-color LED.

- **Run system diagnostics.**

  See your system documentation for available diagnostics and their use.

- **Reinstall the IntelliPort II software drivers.**

  - Reboot from the backup operating system kernel.
  - Reinstall the drivers as described in Chapter 2.

- **If problems persist, call Computone Technical Support.**

All Ports not Responding

Check the following:

- **Check the LED on the end of the IntelliPort II controller.**
  - For Micro Channel controllers, you must remove the system cover to see the LED. For ISA and EISA controllers, the LED is under the bus connector on the outside end of the controller.
  - See "LED Error Codes" in Chapter 5 of the *IntelliPort II Hardware Technical Reference* for information on interpreting the tri-color LED.
- **Make sure the IntelliPort II controller is properly seated in its expansion slot.**
- **Move the IntelliPort II controller to a different expansion slot.**
  - For EISA and Micro Channel systems, you will also need to change the system configuration. See the *IntelliPort II Hardware Reference Guide* for more information.
- **Recheck your installation selections and system files.**
  - Make sure the IntelliPort II software drivers and the controller hardware configuration reference the same IRQ and I/O address. If necessary, reconfigure the drivers or the controller.
  - Make sure all the appropriate system files have been updated. See Chapter 3 for details.
- **Make sure the serial devices are properly configured.**
  - Make sure the serial devices are enabled.
  - Make sure the device settings (data rate, parity, etc.) match the system control files.
- **Reinstall the IntelliPort II software drivers.**
  - Reboot from the backup operating system kernel.
  - Reinstall the drivers as described in Chapter 2.
- **If problems persist, call Computone Technical Support.**

Erratic Serial Operation

This section covers troubleshooting procedures for serial ports that change data rate unexpectedly, run slowly, or otherwise operate improperly. Check the following:

- **Recheck your installation selections and system files.**
  - Make sure the IntelliPort II software drivers and the controller configuration reference the same IRQ and I/O address. If necessary, reconfigure the drivers.
  - Make sure all the appropriate system files have been updated. See the appropriate IntelliPort II software driver manual for details.
- **Make sure the serial devices are properly configured.**
  - Make sure the serial devices are enabled.
  - Make sure the device settings match the system control files.
- **Check your cables.**
  - Make sure you are using the proper cables for the attached device. See the *IntelliPort II Hardware Technical Reference* for cabling details.
  - Make sure the cables are wired correctly, and have no breaks or shorts.
  - Make sure the cable connectors are seated properly.
  - Make sure the cables are properly shielded and do not exceed RS-232 length specifications.
- **Reinstall the IntelliPort II software drivers.**
  - Reboot from the backup operating system kernel.
  - Reinstall the drivers as described in the software installation manual.
- **If problems persist, call Computone Technical Support.**

Ports Lock Up or Hang

Check the following:

- **Check your cables.**
  - Make sure you are using the proper cables for the attached device. See the *IntelliPort II Hardware Technical Reference* for cabling details.
  - Make sure the cables are wired correctly, and have no breaks or shorts.
  - Make sure the cable connectors are seated properly.
  - Make sure the cables are properly shielded and do not exceed RS-232 length specifications.

- **Check the LED on the end of the IntelliPort II controller.**
  - For IntelliPort II Micro Channel controllers, you must remove the system cover to see the LED. For IntelliPort II ISA and EISA controllers, the LED is on the outside edge of the controller.
  - See "LED Error Codes" in Chapter 5 of the *IntelliPort II Hardware Technical Reference* for information on interpreting the tri-color LED.

- **If problems persist, call Computone Technical Support.**

Appendix A
IntelliPort II System Reference

This appendix describes the files and utilities that accompany the IntelliPort II drivers.

The information in this appendix is also available in UNIX "man page" format from the Computone BBS. Download the file *ip2_tar.z* (a compressed tar file) from the BBS.

fip, ip2 - General Information about the IntelliPort II driver

The IntelliPort II driver consists of the following:

- The driver code for the operating system, installed in the kernel.
- The IntelliPort II controller software (also called the *loadware*), installed in the kernel and downloaded into the controller at system startup.
- A number of support utilities and files, installed in various directories.

SVR4 Utilities and Files

The following is a brief description of the IntelliPort II support utilities and files included for SVR4 systems.

/etc/ip2_sysadm — Assigns IntelliFeatures profiles and terminal parameters, and enables logins, for IntelliPort II ports. This utility automatically updates the */etc/inittab*, */etc/ttytype*, and */etc/default/ip2.d/intellitype* files.

/etc/ip2Init — Loads and verifies the *intellicap* and *intellitype* files.

/etc/ip2_reinit — Loads the default *intellicap*, *icap.site*, and *intellitype* files.

/etc/ip2_hot — Enables and disables IntelliView hot-keys for the current port.

/etc/default/ip2.d/intellicap
The default *intellicap* file. This contains the standard IntelliFeatures profiles.

/etc/default/ip2.d/icap.site
The site-specific *intellicap* file, loaded along with the default *intellicap* file (by /etc/ip2_reinit). This contains your customized IntelliFeatures profiles. You should add profiles to this file and not the *intellicap* file.

/etc/default/ip2.d/intellitype
: This file contains the IntelliFeatures profile assignment for each port.

SVR3.2 and XENIX Utilities and Files

The following is a brief description of the IntelliPort II support utilities and files included for systems other than SVR4.

/etc/mkdev fip
: Assigns IntelliFeatures profiles and terminal parameters, and enables logins, for IntelliPort II ports. This utility automatically updates the */etc/ttys* (XENIX only), */etc/inittab*, */etc/ttytype*, and */etc/default/fip.d/intellitype* files.

/etc/fipInit
: Loads and verifies the *intellicap* and *intellitype* files.

/etc/fip_reinit
: Loads the default *intellicap*, *icap.site*, and *intellitype* files.

/etc/fip_hot
: Enables and disables IntelliView hot-keys for the current port.

/etc/default/fip.d/intellicap
: The default *intellicap* file. This contains the standard IntelliFeatures profiles.

/etc/default/fip.d/icap.site
: The site-specific *intellicap* file, loaded along with the default *intellicap* file (by /etc/fip_reinit). This contains your customized IntelliFeatures profiles. You should add profiles to this file and not the *intellicap* file.

/etc/default/fip.d/intellitype
: This file contains the IntelliFeatures profile assignment for each port.

fip_hot, ip2_hot - Enable and Disable IntelliView hot keys

fip_hot and *ip2_hot* are utilities that let you enable and disable the hot keys that switch between IntelliView screens. *fip_hot* and *ip2_hot* affect only the current port.

Synopsis

```
ip2_hot [-b] [-n]      (SVR4 systems)
fip_hot [-b] [-n]      (other systems)
```

Running *fip_hot* or *ip2_hot* displays the current hot-key scanning state for the port. This is either "`blocked`" if hot-key scanning is disabled, or "`not blocked`" if hot-key scanning is enabled.

`-b` Disables hot-key scanning for this port.

`-n` Enables hot-key scanning for this port.

Notes on Hot Keys

If you press a hot-key and nothing happens, it may be because you pressed **CTRL-S** earlier. Resist the temptation to keep pressing the hot-key until something happens. First, try pressing **CTRL-Q**.

When using a hot-key sequence, you may not receive a response after pressing a key. This can occur if you have a hot-key sequence with first character that matches a sequence for another operation. For example, the **ESC** key may represent "escape from the program" whereas you may have assigned a hot-key sequence that begins with **ESC**. To resolve this situation, you can assign a time-out value to the hot-key sequence so that if the rest of the sequence does not follow the initial key (**ESC**) within a few seconds, then the program will take the action of the first key.

To adjust the time-out, edit the file */etc/default/fip.d/intellicap* or the file */etc/default/fip.d/icap.site* (depending on where you have defined your profile) and change/add the line *timeout = 0* to read *timeout = x* (where *x* represents tenths of a second in values from 1 to 255). When *timeout = 0*, the session waits for the rest of the hot-key sequence, or until it receive a key that invalidates the hot-key sequence.

When to Disable Hot-Key Scanning

You should disable hot-key scanning (by using *fip_hot -b* or *ip2_hot -b*) under the following circumstances:

During a file transfer

When using IntelliView with terminal emulators, you should disable hot-key scanning before doing a file transfer.

While using PC-Scan mode

If you are running an application that places your terminal in "PC-scan" mode, the terminal's keys no longer send their normal ASCII codes. Since keys no longer send the expected codes, you should disable hot-key scanning.

When applications require the hot-key

If you are running an application that requires the use of a function key that is also being used as a hot-key for screen switches, disable hot-key scanning.

When using *CU*

If you must *cu* out a non-modem port while processes are enabled on the modem port and Alternate screens, disable hot-key scanning.

fip_reinit, ip2_reinit - Load Default IntelliFeatures Profile Definitions

fip_reinit and *ip2_reinit* are shell scripts that call *fipInit* or *ip2Init*, respectively, to load the default *intellicap*, *icap.site*, and *intellitype* files into the IntelliPort II hardware.

Synopsis

`/etc/ip2_reinit` (UNIX SVR4)

`/etc/fip_reinit` (all others)

fipInit, ip2Init - Load IntelliFeatures Profile Definitions

The *fipInit* and *ip2Init* utilities let you load and verify IntelliFeatures profiles, change the profile that a port uses, and print a list of valid IntellFeatures parameters. *fipInit* and *ip2Init* can affect all ports on an IntelliPort II controller, and therefore should be used only by the system administrator.

Synopsis

SVR4 systems:

```
ip2Init [icap...] [itype...] -n [nodefile...]
ip2Init [-v | -vp] [icap...] [itype...] -n [nodefile...]
ip2Init icap [-p profile_name]  IntelliPort_device
ip2Init -parameters
```

Other systems:

```
fipInit [icap...] [itype...] -n [nodefile...]
fipInit [-v | -vp] [icap...] [itype...] -n [nodefile...]
fipInit icap [-p profile_name]  Intelliport_device
fipInit -parameters
```

Loading *intellicap* and *intellitype* Files

To load (or reload) the driver with *intellicap* and *intellitype* files, use the following format:

```
ip2Init [icap...] [itype...] -n [nodefile...]    (SVR4 systems)
fipInit [icap...] [itype...] -n [nodefile...]    (other systems)
```

This is the format used by */etc/ip2_reinit* and */etc/fip_reinit* to load the default *intellicap*, *icap.site*, and *intellitype* files.

You must include the full correct pathnames of all specified files (for example, */etc/default/fip.d/intellicap*). *fipInit* and *ip2Init* do not require the files to have specific names, and there are no default names. Only their presence on the *fipInit* or *ip2Init* command line identifies them as such.

The **-n** option specifies one or more nodefiles to load. The nodefiles are usually kept in the same directory as the default *intellicap*, *icap.site*, and *intellitype* files, and identify the proper minor device numbers for any

IntelliPort device. Separate nodefiles exist for each IntelliPort II major device.

The nodefile has a name similar to *fipNode.fi10*. You must specify a nodefile when loading the *intellicap* and *intellitype* files.

Profiles must be loaded into the IntelliPort II using *fip_init* or *ip2_init* before they are available for use.

Validating *intellicap* and *intellitype* Profiles

To validate new or modified *intellicap* and *intellitype* profiles, use the following format:

```
ip2Init [-v | -vp] [icap...] [itype...] -n [nodefile...]   (SVR4)
fipInit [-v | -vp] [icap...] [itype...] -n [nodefile...]   (other)
```

where:

-vp Verifies *intellicap* profile syntax only (drivers are not referenced).

-v Verifies *intellicap* profile syntax and driver support levels. *ip2Init* or *fipInit* accesses the drivers to determine the support level, but does not download the profiles.

Changing the Profile Assignment for a Device

To change the profile assignment for a single device, use the following format:

```
ip2Init icap [-p profile_name]  IntelliPort_device   (SVR4)
fipInit icap [-p profile_name]  IntelliPort_device   (other)
```

The *icap* and *IntelliPort_device* parameters are required. Specify the full device name of the IntelliPort II device (for example, */dev/ttys01*).

If you do not specify a profile name (by using the **-p** option), then *fipInit* or *ip2Init* takes the profile label name from the environment variable $TERM.

Listing *fipInit* and *ip2Init* Parameters

To obtain a list of valid IntelliFeatures parameters, use the following format:

```
ip2Init -parameters          (SVR4 systems)
fipInit -parameters          (other systems)
```

intellicap, icap.site - IntelliFeatures profile definitions

The *intellicap* and *icap.site* files contain IntelliFeatures profile definitions. These files are found in one of the following directories:

/etc/default/ip2.d	(SVR4 systems)
/etc/default/fip.d	(other systems)

The files in these directories named *intellicap* and *icap.site* are automatically loaded into the IntelliPort II driver at system startup time. They can be reloaded (for example, if the system administrator adds a profile definition to *icap.site*) by running the */etc/fip_reinit* or */etc/ip2_reinit* shell scripts.

➨ **Note**: If you add profile definitions to the *intellicap* file, those definitions are lost whenever you re-install or upgrade the IntelliPort II drivers. You should make all changes to the *icap.site* file, which the installation utility leaves intact.

The format of an IntelliFeatures profile is as follows:

```
$label: [= $label]
   keyword = value
   ...
```

Keywords specified in derived profiles override keywords in earlier profiles, but *only for the derived profile*. For example, you can define a profile that uses the values defined by another profile called `ansi`, but overrides the values for the `logins` and `nextscreen` keywords. Ports assigned to the `ansi` profile use the values originally assigned to that profile.

You can insert comments in the file by using the pound sign (#). Comments begin at the pound sign and continue to the end of the line. You can place a pound sign within a quoted string, but it is then treated as a character and not the beginning of a comment. Within the `help` string parameter, the # sign indicates a newline character.

Numeric Values for Keywords

If any keyword requires a numeric value, it can be entered in:

- Decimal, with no leading zero (0); or
- Octal, with a leading zero (0); or
- Hexadecimal, with a leading zero and lower-case x (0x).

For example, the values 25, 031, and 0x19 all represent the same number. (Entries in the tables on the following pages are all in decimal.)

If a keyword requires a character string, the string may include ASCII control characters. A string can be represented as a sequence of numbers which represent the ASCII value, separated by commas.

A string can also be represented as an ASCII string enclosed single or double quotes; within quotes, certain character sequences have special meaning:

DOS-style CTRL Character Representations

'^A'	represents CTRL A	(0x01),
'^B'	represents CTRL B	(0x02),
'^['	represents CTRL [	(ESC) (0x1b), and so on

"C"-style CTRL Character Representations

'\E'	represents ESC (0x1b)
'\n'	represents Line Feed (Newline)
'\r'	represents Carriage Return
'\b'	represents Backspace
'\t'	represents Tab
'\v'	represents Vertical Tab
'\f'	represents Form Feed
'\\'	represents " \ "
'\^'	represents " ^ "'
'\000'	represents null; any other value may be expressed as a three-digit octal constant.

For example, each of the following have the same effect:

```
nextscreen    =    1, 65, 66, 10
nextscreen    =    1, 0x41, 0x42, 0xa
nextscreen    =    '^AAB^J'
nextscreen    =    '\001AB\n'
nextscreen    =    1,'AB',0xa
```

Common Keywords

IntelliPrint, IntelliSet, and IntelliView have their own sets of keywords, which are documented in their own sections. There are two keywords that are common to all three IntelliFeatures:

`desc.` The profile description. This is a string of up to 56 characters that appears in the *mkdev fip* (*ip2_sysadm*, for SVR4 systems) window when you ask for a list of valid IntelliFeatures profiles. You can also spell out this keyword as `description`.

`help` The help string. This is a string of up to 126 characters that appears when you press **F1** in the profile list. The help string for the profile under the highlight bar is displayed. You can insert a pound sign (#) within the string to force a line break when the help text is printed.

IntelliPrint - Support for Auxiliary Printers

IntelliPrint lets users transparently access the AUX (auxiliary) port present on many terminals. A printer connected to a serial or parallel AUX port appears to the system as a separate device.

IntelliPrint multiplexes data between the terminal's screen and the printer. Control sequences, inserted by IntelliPrint and supported by the terminal, route data to the screen or to the printer.

The IntelliPrint parameters are:

Parameter	Description	Range
startdelay	The time to delay before starting a print job, in 1/10-second intervals.	1 to 100
pause	The time to delay between blocks of printer data, in 1/10-second intervals.	1 to 50
printon	The character sequence, sent to the terminal, that routes data to the printer.	String, up to 15 characters
printoff	The character sequence, sent to the terminal, that routes data to the screen.	String, up to 15 characters
paddcr	Determines whether IntelliPrint should translate newline to CR/LF (if no, the printer or terminal handles the translation).	One of the following: yes y true no n false
ptab	Determines whether IntelliPrint should expand tabs (if no, the printer handles tabs).	One of the following: yes y true no n false

IntelliSet - Configuration Parameters for IntelliPort II Ports

IntelliSet lets you select data rate, flow control, and similar hardware-related features that are not directly supported by the operating system or device drivers. You can lock individual parameters in place, or specify them as defaults that can be subsequently changed.

IntelliSet may be used in combination with other features; settings affect all virtual devices (IntelliView Alternate screens and IntelliPrint). IntelliSet parameters are very useful for connecting devices such as printers, that do not go through the normal login process.

The IntelliSet parameters are:

Parameter	Description	Range
baud	The data rate used for both transmit and receive. Do not use this parameter if you are using inbaud or outbaud.	One of the following: 50 75 110 134 134.5 150 200 300 600 1200 1800 2000 2400 3600 4800 7200 9600 19200 38400 56000 57600 64000 76800 115200 custom1 custom2 50! 75! 110! 134! 134.5! 150! 200! 300! 600! 1200! 1800! 2000! 2400! 3600! 4800! 7200! 9600! 19200! 38400! 56000! 57600! 64000! 76800! 115200! custom1! custom2!
inbaud	The data rate used for receive. Use this parameter in conjunction with outbaud. Do not use this parameter with baud.	
outbaud	The data rate used for transmit. Use this parameter in conjunction with inbaud. Do not use this parameter with baud.	
stop	The number of stop bits sent (and expected) with each character.	One of the following: 1 1+ 1.5 2 1! 1+! 1.5! 2!

Parameter	Description	Range
parity	The parity sent (and expected) with each character.	One of the following: none noparity mark 1 space 0 odd even none! noparity! mark! 1! space! 0! odd! even!
size	The size, in bits, of each character.	One of the following: 5 6 7 8 5bits 6bits 7bits 8bits 5! 6! 7! 8! 5bits! 6bits! 7bits! 8bits!
inflow	The flow control method used for data coming into the terminal.	One or more of the following: none xonxoff xon dtr rts busyready none! xonxoff! xon! dtr! rts! busyready!
outflow	The flow control method used for data coming into the IntelliPort II.	One or more of the following: none xonxoff xon ixany xany xonxany cts dsr busyready none! xonxoff! xon! ixany! xany! xonxany! cts! dsr! busyready!
local	Determines whether the IntelliPort II ignores changes in the state of DCD for this port.	One of the following: yes y true no n false yes! y! true! no! n! false!
hduplex	Determines whether this port uses half-duplex. If you use half-duplex, "inflow" must use rts and "outflow" must use cts.	One of the following: yes y true no n false yes! y! true! no! n! false!

Parameter	Description	Range
ixon	Custom X-ON character for flow control of data coming from the terminal.	0 to 255
oxon	Custom X-ON character for flow control of data coming from the IntelliPort II.	0 to 255
ixoff	Custom X-OFF character for flow control of data coming from the terminal.	0 to 255
oxoff	Custom X-OFF character for flow control of data coming from the IntelliPort II.	0 to 255
onlcr	Determines whether the Intelliport II translates newlines (in data sent to the terminal) to CR/LF.	One of the following: yes y true no n false yes! y! true! no! n! false!
tab	Determines whether the IntelliPort II expands tabs in data sent to the terminal.	One of the following: yes y true no n false yes! y! true! no! n! false!
noflush	Determines whether the IntelliPort II inhibits flushing of data when the session closes.	One of the following: yes y true no n false yes! y! true! no! n! false!
osproc	Determines whether the IntelliPort II uses operating system line disciplines.	One of the following: yes y true no n false yes! y! true! no! n! false!
custom1	Sets the "custom1" data rate for baud, inbaud, and outbaud.	48 to 115200
custom2	Sets the "custom2" data rate for baud, inbaud, and outbaud.	48 to 115200

intellitype - IntelliFeatures Device Assignment Table

An *intellitype* file contains lines of the general form:

```
device: = $label
```

where `label` is a label defined in an *intellicap* file, and `device` is the name of the IntelliPort device (for example, `ttys00`).

By default, the *intellitype* file is one of the following:

/etc/default/ip2.d/intellitype (SVR4 systems)
/etc/default/fip.d/intellitype (other systems)

You load an *intellitype* file with the *ip2Init* or *fipInit* utility.

The default *intellitype* file is loaded along with the *intellicap* files during system startup. To make changes to an *intellitype* file, you can either edit the file manually or use *mkdev fip* or *ip2_sysadm* to automatically update the file.

IntelliView - Support for Multi-screen Terminals

IntelliView lets a terminal with multi-page memory display up to eight different screens, letting users instantly toggle from one screen to another. The maximum number of screens supported by each IntelliPort II controller is specified during software installation (Chapter 2).

IntelliView supports a Main screen and up to seven Alternate screens on each terminal or workstation that is connected to an IntelliPort II. IntelliView scans incoming keys for special sequences (generally sent by function keys) which the user presses to switch from screen to screen.

The IntelliView parameters are:

Parameter	Description	Range
logins	The maximum number of screens enabled for login. The actual number of logins is the lesser of this parameter and the "Max Number of Screens" determined during installation.	1 to 8
nextscreen	The hot-key sequence that selects the next IntelliView screen.	String, up to 7 characters
screen1	The character sequence sent to the terminal that selects screen 1.	String, up to 15 characters
goto1	The hot-key sequence that selects screen 1.	String, up to 7 characters
screen2	The character sequence sent to the terminal that selects screen 2.	String, up to 15 characters
goto2	The hot-key sequence that selects screen 2.	String, up to 7 characters

Parameter	Description	Range
screen3	The character sequence sent to the terminal that selects screen 3.	String, up to 15 characters
goto3	The hot-key sequence that selects screen 3.	String, up to 7 characters
screen4	The character sequence sent to the terminal that selects screen 4.	String, up to 15 characters
goto4	The hot-key sequence that selects screen 4.	String, up to 7 characters
screen5	The character sequence sent to the terminal that selects screen 5.	String, up to 15 characters
goto5	The hot-key sequence that selects screen 5.	String, up to 7 characters
screen6	The character sequence sent to the terminal that selects screen 6.	String, up to 15 characters
goto6	The hot-key sequence that selects screen 6.	String, up to 7 characters
screen7	The character sequence sent to the terminal that selects screen 7.	String, up to 15 characters
goto7	The hot-key sequence that selects screen 7.	String, up to 7 characters
screen8	The character sequence sent to the terminal that selects screen 8.	String, up to 15 characters

Parameter	Description	Range
goto8	The hot-key sequence that selects screen 8.	String, up to 7 characters
timeout	The time, in 1/10-second intervals, in which a hot-key sequence must be completed. If the hot-key sequence is not completed in this period, the characters are sent to the system. This is useful, for example, with applications that require keystrokes that also begin a hot-key sequence (**ESC** is a common example). By setting the timeout parameter properly, applications and hot-key sequences can share initial character sequences without appreciably slowing response time.	Numeric value from 0 to 255

mkdev fip, ip2_sysadm - Assign IntelliFeatures Profiles to Ports

The *mkdev fip* (SVR3.2, XENIX) and *ip2_sysadm* (SVR4) commands let you:

- Assign IntelliFeatures profiles to all IntelliPort II ports
- Enable logins for each port
- Assign terminal types to each port

You can perform these tasks by manually editing the */etc/ttys* (XENIX only), */etc/inittab*, */etc/ttytype*, and *intellitype* files, but *mkdev fip* and *ip2_sysadm* give you interactive control over terminal parameters and automatically update these files as needed.

When you start *mkdev fip* or *ip2_sysadm*, you see a screen that lists the IntelliPort II devices (which correspond to the Main screen) and the current IntelliFeatures profile assignment for each port. To see a list of valid profiles, press **F2**. You can select a profile by scrolling through the list (using the arrow keys and **PgUp** and **PgDn** keys and pressing **ENTER** when the correct profile is highlighted. When you have assigned profiles to all ports, press **F3** to move to the next screen or **F4** to quit the program without making any changes.

On the second screen, you assign the terminal type (from *termcap*), login action (none, Main screen only, or all screens), the port type (modem or non-modem), and *getty* code. When you are finished, press **F3** to save changes and exit or **F4** to exit without saving changes.

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IntelliPort II / IntelliPort II EXpandable

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